JULY 8, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

production ideas

NO. 12 OF A SERIES

ROLL FORGING

New versions of an old process tackle precision jobs . . . page 97

- **After Steel: Another Price Spiral? —page 53**
- **Structurals, Plates: Peaking Out —page 129**

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FIRST 2 OXYGEN CONVERTER INSTALLATIONS IN THE UNITED STATES EC&M CONTROLLED!

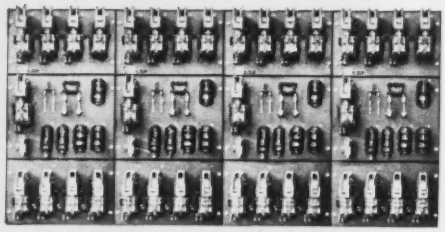
for basic steel making... it's EC&M CONTROL

EC&M control has proved itself by years of consistent performance in basic steel making processes —ore handling, hearth charging, ladle cranes, hot metal mixers, Bessemer converters.

The same exacting standards of safety and efficiency have been designed into the EC&M equipment which controls the new Oxygen Converter process.

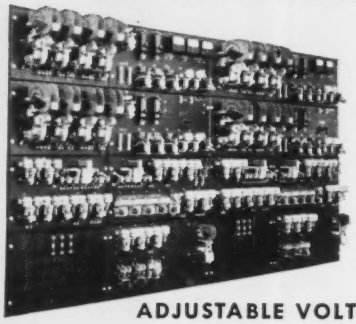
You'll find your nearby Field Engineer a source of sound counsel in solving any electrical control problem.

2 Types of Control for 2-Motor Vessel Tilt Drives

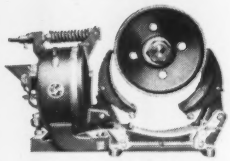


CONSTANT POTENTIAL

1. Speed Control Master Switch



ADJUSTABLE VOLTAGE



2. Dual-Coil Series or Shunt Wound Brakes

THE ELECTRIC CONTROLLER & MFG. CO.

A DIVISION OF THE SQUARE D COMPANY

CLEVELAND 28 • OHIO

8853

Sound Welds With Bethlehem Heads

Bethlehem Flanged-and-Dished Heads are easy to weld because they are made from grades of steel of uniformly high quality.

Types furnished include ASME Code, standard and elliptical flanged-and-dished, flanged-only, shallow-dished, tank-car, obround and double-dished. Diameters: up to 144 in.; thickness: 14 gage to 2½ in.

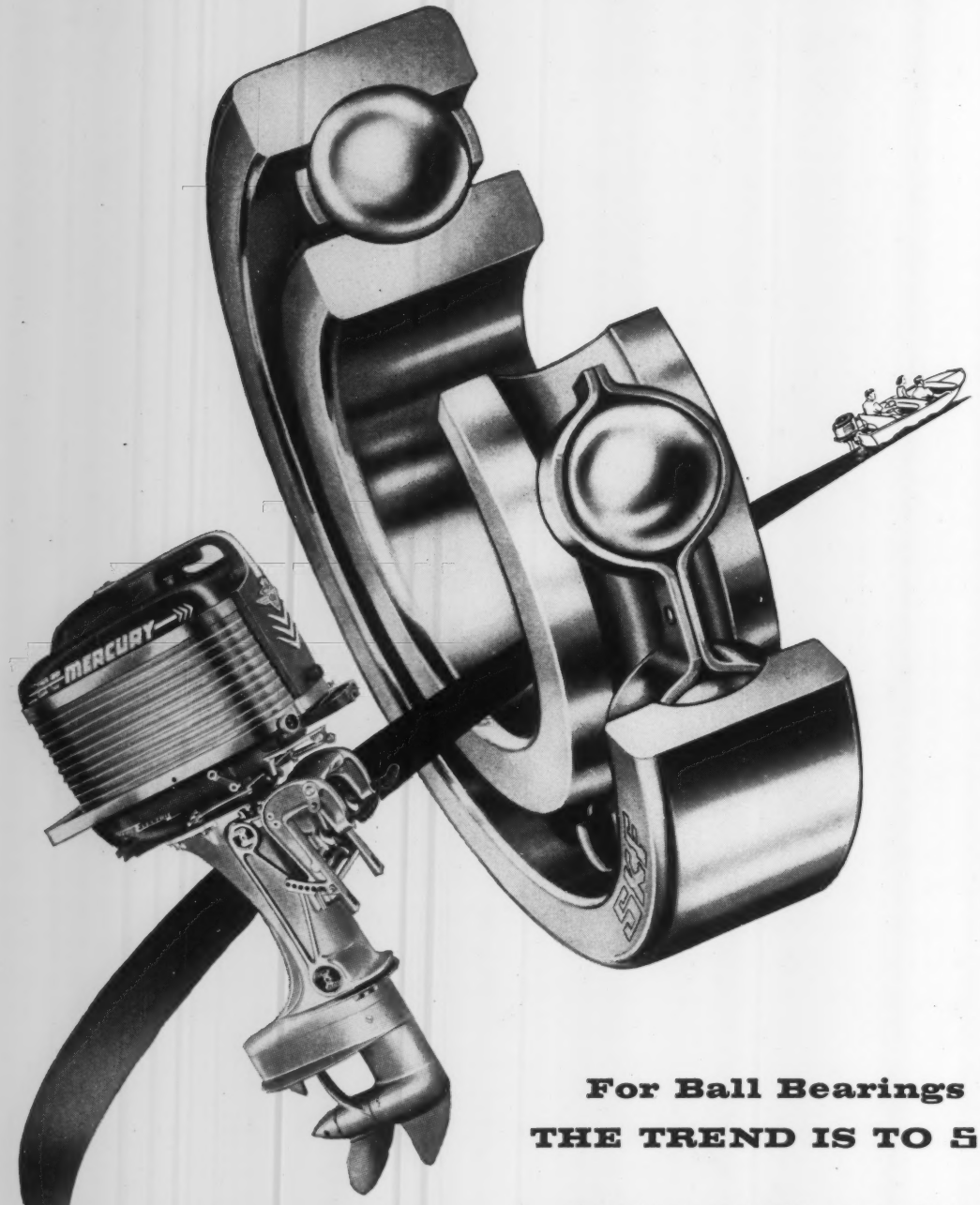
Bethlehem also produces standard manhole and handhole saddles, covers and fittings. We also furnish heads with flued openings. To help you maintain production schedules, Bethlehem stocks a number of flanged-and-dished heads for prompt delivery. Write to the nearest sales office for our stock list, or for full information on Bethlehem heads to meet your requirements.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



For Ball Bearings
THE TREND IS TO SKF®

Sleek, slim, powerful, quiet... *Mercury Outboards* are the ruler of speed and spray – "Master of the Waterways." Kiekhaefer Corporation, who makes them, was first to feature extensive use of anti-friction bearings in outboards. And Kiekhaefer is another concern that purchases single row, deep groove ball bearings from SKF.

It's a trend... brought about because those whose business is to buy bearings recognize the improvements SKF has achieved in ball bearings – improvements in quiet running, improvements in sealing, improvements in bearing life. Maybe *you* too should switch to SKF Ball Bearings.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

7709

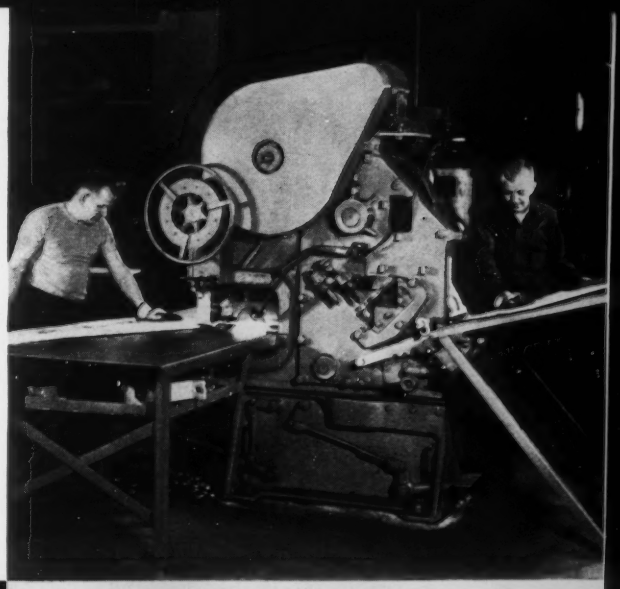
SKF

has them all

Ball Bearings ◯ Cylindrical Roller Bearings ▭

Spherical Roller Bearings ▭ Tyson Tapered Roller Bearings ▭

work 2 shifts simultaneously with either the Kling Combination or Double Angle Shears



MEN WHO KNOW CHOOSE Kling WORKHORSES

KLING COMBINATION

"Works 2 shifts in one".

Men who know say:

"For just a little more than the cost of a Shear or Punch alone, we get a machine that does the work of a half dozen machines. Saves floor space too, makes every square foot do multiple duty."

"2 men can work at each machine, simultaneously, each turning out totally different work, if desired."

Write for Bulletin 347 for money-saving facts.

KLING DOUBLE ANGLE SHEARS

"Works 2 shifts in one".

Men who know say:

"Now 1 man can cut angles while another is cutting bars, simultaneously! And we can cut rounds or plates, whichever meets our needs best. Automatic hold-downs available in all models which range up in capacity to handle angles to 8" x 8" x 1¼".

"Actually 2 shears in one machine. Now we do in hours what used to take us days!"

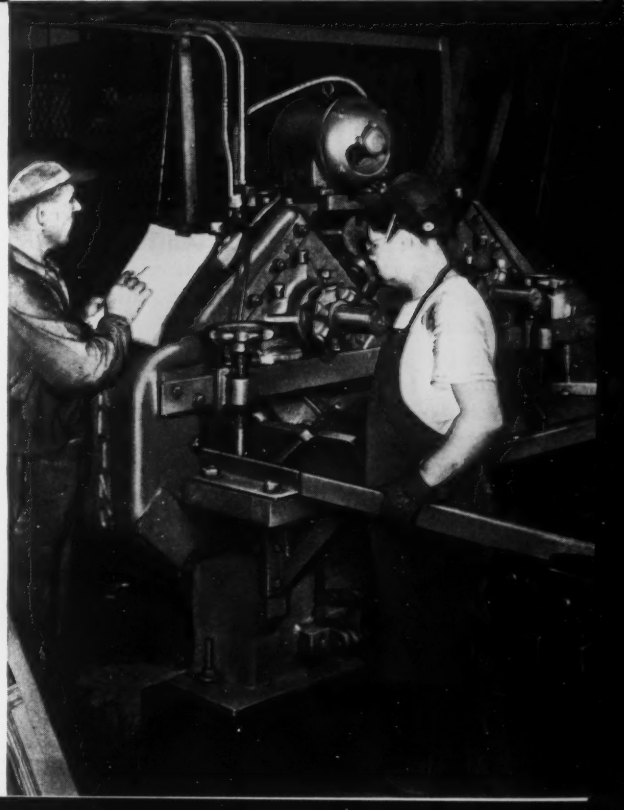
Write for Bulletin DA-2345 for cost-cutting facts.

You can actually work 2 shifts on either of these two Workhorses. With the Combination, you can shear, punch, cope, miter, cut, etc. Many of these operations can be done simultaneously.

With the Double Angle Shears and its two cutting sides you can shear bars, rounds, angles, flats. Perform one operation twice as fast by using both sides of the shear or work any combination of two simultaneously.

Men who know expect this money-saving — production-increasing performance that is typical of all KLING Workhorse Machines . . . get the facts from these men . . . the men who buy, operate and own KLING Workhorses. We'll gladly send you a list of users near you and the name of your local distributor. Their testimony is your assurance of real Workhorse performance.

KLING Workhorses include *Rotary Shears, Double Angle Shears, Guillotine Shears, Angle Bending Rolls, Combination Shear, Punch & Coper, Plate Bending Rolls, Friction Saws, Mill All, etc.*



KLING BROS. ENGINEERING WORKS

1320 N. KOSTNER AVE. • CHICAGO 51, ILL.

Export Distributor: Simmons Machine Tool Corp., 50 E. 42nd Street, New York 17

Exclusive Canadian Distributor:
Brown-Boggs Foundry & Machine Co. Ltd., Hamilton, Ontario

GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
Rubber Bulge Casing for Forming Metal Parts
A Metal sleeve
B Hydraulic fluid
C Oil-resistant rubber bag
D Specially compounded, solid rubber casing, carefully ground to exact dimensions
E Aluminum sheet
F Steel mold

A new "form" of profit!

Fuel tanks for jet fighters are produced faster and cheaper by the new process pictured above. It's the development of a Midwestern manufacturer and employs rubber "bulge casings"—expanded by hydraulic pressure—to form the tank sections against metal molds.

But the first bulge casings—made of rubber strips bonded together—broke apart after only 30 to 40 units had been formed. Repairs were difficult—didn't last. Finally they called in the G.T.M.—Goodyear Technical Man.

He soon had the answer. Calling on his experience with rubber-covered rolls, he came up with a special one-piece rubber casing with no seams to separate. And the rubber was especially compounded to withstand constant flexing. Result: At last report the G.T.M.'s casing had turned out *over 500 units without slightest sign of wear.*

Breaking through bottlenecks like this one—with special or standard industrial rubber products—is routine to the G.T.M. To turn his problem-solving ability loose on your tie-ups, just write

Goodyear, Industrial Products Division,
Akron 16, Ohio

GOODYEAR

THE GREATEST NAME IN RUBBER

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The Metalworking Weekly

July 8, 1957
Vol. 141 No. 2

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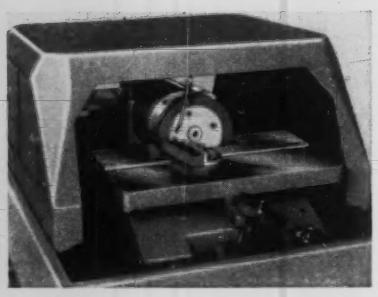
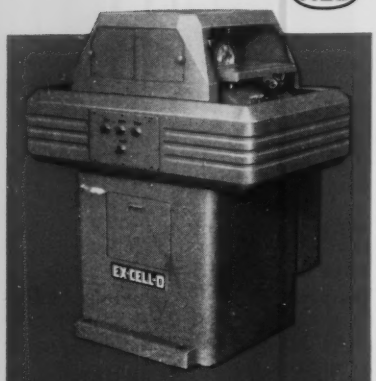


IMPROVED 8 WAYS

All Ex-Cell-O Tool Grinders offer these 8 bonus features:

1. now equipped for electrolytic grinding
2. uniform surface speed *for life of wheel*
3. double-end grinders
4. ruggedness and versatility
5. accurate angular table adjustment
6. wet or dry grinding
7. complete safety, protection for operators from coolant
8. tables that adjust toward wheels to allow for wear

XLO



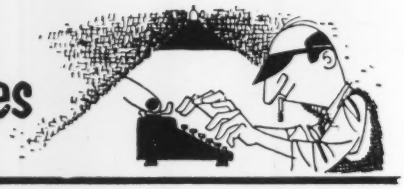
STYLE 44-A (above) for carbide tipped or solid carbide tools. Ex-Cell-O offers a complete line of tool grinders for every shop, every type of tool. See your Ex-Cell-O representative or write Ex-Cell-O, Detroit.

57-32

EX-CELL-O FOR PRECISION

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

behind the scenes



All About Seniority

Of course we never question
The management's authority:
We let them run the office,
Though they're really a minority.
But never, comrades, never
Will we sacrifice priority,
Nor ever sign a contract
That weakens our seniority!

Yes, you may be excused for wondering why we leap into this week's effusion from a doggerel springboard, but let us assure you that we have excellent precedent. Many years ago it was a custom in England to approach a delicate or explosive subject by resorting to simple rhymes. Apparently, the persons whom the rhymes referred to were simple, too, because they never seemed to catch on. The whole country could be chuckling about the cat and the fiddle, and the barber who shaved a pig and similar stories, while the principals blandly adjusted their wigs and farthingales in the fatuous security provided by the dictum lese majeste. An old revolutionary like Shrdlu would have had a wonderful time in those days, writing snide and scurrilous comments about pompous popinjays—what's that? Oh, to be sure: Back to our subject, which happens to be the thorny question of seniority in labor contracts.

STEEL's Bill Dean comes up with a solid report this week (page 58) on items to consider when negotiating union contracts covering seniority. Roughly, management is traditionally cool toward seniority, but labor loves it. When two diverse segments of industry are poles apart on any given subject, that subject automatically becomes hot, delicate or explosive, particularly when a third party sticks his big nose into it. That's why we merely mention it here, then leap to one side.

The problems of seniority are really difficult. The man who does the hiring and firing believes he has the right to promote or discharge whomsoever he pleases, but he is just kidding himself, unless he has sold a good contract. Labor often says the man with the most seniority should get the promotion, even if he is a schmo; that the man with the least company time should be laid off, if conditions warrant it, even if he is the smartest and most competent man on the payroll.

Definitely Offbeat

Those early verses bring to mind the weird and wonderful lyrics written today for persons who beat guitars and sing for recording companies. If you are unacquainted with modern methods of pronunciation you'll get left behind every time. We asked a little man named Ralph, a hot-shot contemporary disc lark, to compose a song about a union that wins a seniority contract. In a flash he donned his guitar, threw back his head and intoned the following beautiful composition:

Uh-uh baby I uh say you aint a-gonna cruh-eye,
Cause-uh baby I'm a-tellin' you-a whuh-eye——
A beedle beedle boodle oodle oo' OW!
Well-a, say! We gotta coh-hun-trah-hact whuh-uh-hun
For-a good old you-huh-yun,
An' ever'thang is SEE-n-YORE-it-TEE nao-o-o-w!
YAH!

More Matches

Bill Woodruff, Mexico Refractories, Mexico, Mo.; the gang at General Steel Castings, Granite City, Ill.; Harold Boyer, Union Fork & Hoe Co., Columbus, O.; and C. Leonard Forbes, A. R. Wilfley & Sons Inc., Denver, were first in with the match equation. While they were all right, curiously enough none hit the exact answer, which happened to be the transfer of one match below the plus sign, making a sneaky "one *plus or minus* nothing equals one."

The best thing about match equations is that you can spread them out on a bar and astound the most phlegmatic barkeeper. If you have a favorite barkeeper, ask him about this oldie:

This equation is false as it stands. You are supposed to move one match and correct it.

Shrdlu

(Metalworking Outlook—Page 47)

Ex-Cell-O Style 43-A Method X Tool Sharpener uses inexpensive cast-iron disk in place of conventional, but costly, diamond-faced grinding wheel.

XLO EX-CELL-O FOR PRECISION

Ex-Cell-O Method X Tool Sharpener Cuts Carbides Without Expensive Wheels

Compare the cost! Diamond wheel cost in off-hand tool grinding runs *eight to twelve dollars* per cubic inch of carbide removed. Wheel expense with Method X averages *only 20 cents.*

Compare the work! Method X produces no thermal stresses—won't chip or score carbide tips. Both carbide and shank are removed simultaneously—no need grinding secondary clearances.

Compare the operation! Operators can handle Method X Machines without special training. No pressure on the workpiece means less operator fatigue. Cutting speed (comparable to diamond wheel grinding) and desired matte finish—simply a matter of setting a power selector switch.

For full information on Method X send today for your copy of Ex-Cell-O's illustrated Bulletin #43272. Or ask your local Ex-Cell-O Representative for one.

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DETROIT 32, MICHIGAN
Machinery Division

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

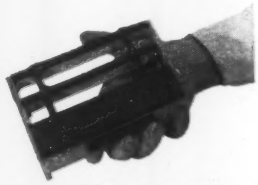
57-40

Eliminate slipping accidents!

Relgrit Abrasive Embedded Grating Treads

Industrial plants throughout the country have found that Relgrit has practically eliminated slipping accidents wherever used.

Relgrit treads are made with an aluminum oxide abrasive, embedded in a "V" groove at the top of the grating bars and nosing. This forms a skid-proof surface that is virtually immune to wear; providing *permanent* protection from slippery surfaces due to water, mud, oil, grease, acids and chemicals. Relgrit is also made for platforms and all other grating areas.



Write for free sample and literature

You can't slip on Relgrit

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P. O. Box 510-L, McKeesport (Pittsburgh District), Pa.

Relgrit Abrasive Gratings and Treads • Lightweight Bridge Flooring • Steel, Stainless and Aluminum Grating • Steel Mill Equipment

"With Weirkote® you can forget plating or dipping after fabrication. It just won't peel or flake!"

Q.—Weirkote—is that a new kind of steel?

A.—*"New" only to those who don't know of its advantages. It's a zinc-coated steel with a skin-tight surface, produced by a continuous galvanizing process instead of the old pot-dip method.*

Q.—Well, we've tried galvanized before for the parts and products we make. But it just couldn't stand up under the punishment of fabrication.

A.—*Must have been the old type galvanized. When you use Weirkote for fabrication, you'll find its surface stands up under the severest stresses. Punch it, lock it, crimp it, deep-draw it—its zinc coating stays intact. It's got a* built-in *resistance to peeling and flaking.*

Q.—Well, say—that'd save all the cost of plating or dipping after fabrication, wouldn't it?

A.—*Exactly! Plus assuring you a* uniform *protective coating at all times—something even a special coating doesn't always provide on the more intricately fabricated parts.*

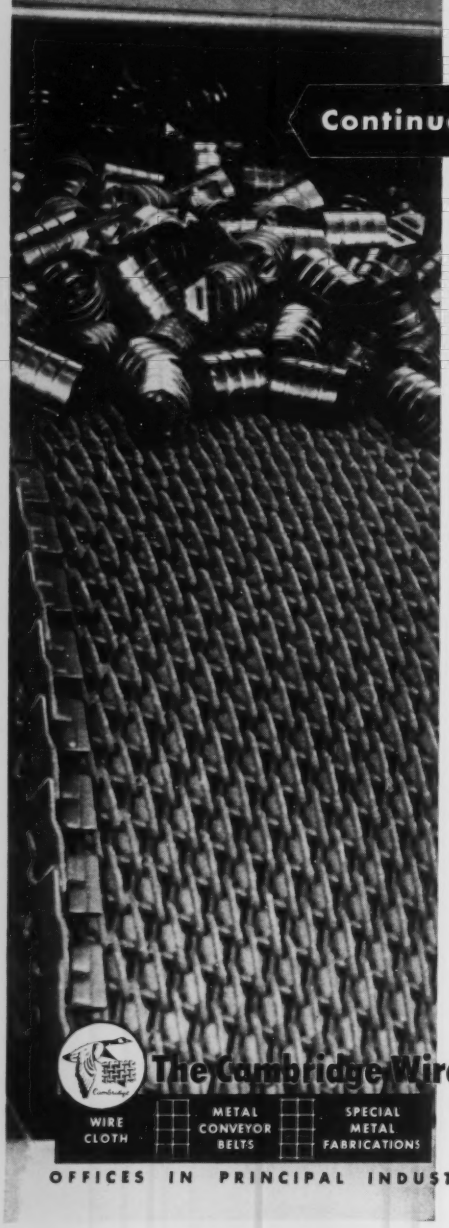
Send today for free booklet that details the time- and cost-saving advantages of using skin-tight zinc-coated Weirkote. Write Weirton Steel Company, Dept. B-1, Weirton, West Virginia.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA
a division of
NATIONAL STEEL CORPORATION

HOW *Cambridge* Woven Wire Belts help Heat Treaters

increase uniformity, speed production

By providing continuous movement through heat treating cycles, woven wire conveyor belts eliminate batch handling, increase product uniformity and production capacity in annealing, brazing, quenching, tempering, sintering, etc. EXAMPLE:



Continuous Annealing

MOVING BELT carries a stream of brass light bulb ferrules through furnace for continuous uniform annealing at 1400° F.

OPEN MESH of Cambridge belt allows free circulation of heat around load so that hot spots are eliminated. Open mesh construction also permits rapid drainage in wet processes such as quenching and washing.

ALL-METAL BELT withstands heat up to 2100°F. (as in copper brazing) without damage, provides lasting strength because there are no seams, lacers or fasteners to break or wear.

SPECIAL RAISED EDGES hold parts on belt, are typical of a variety of side and surface attachments available to hold the product during flat or inclined movement.

Cambridge Woven Wire Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to discuss how you can cut costs with continuous processing on woven wire conveyor belts. Look for his phone number under "Belting, Mechanical" in the Yellow Pages or write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.

Department J, Cambridge 7, Maryland

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

LETTERS
TO THE EDITORS

Articles Tempt Reader

We are often tempted to write and ask for copies of the excellent technical articles appearing in STEEL but try not to take too much advantage of your quick and congenial service.

We have found, however, another article of real interest. We would appreciate five reprints of the article, "Turk's-Heads Shape Production Parts" (June 17, page 104).

Russell A. Yeo
Measurements & Control Data Specialist
F.P.L.D. Adv. Mfg. Engineering
Aircraft Gas Turbine Division
General Electric Co.
Cincinnati

Labor: Most Timely Subject

In your May 20 issue was an interesting article, "White-Collar Drive Falters" (page 95). I would appreciate six reprints of that most timely subject.

R. Douglas Gregg
Management Advisory Group
East Walpole, Mass.

Superb Job of Presentation

Having received two marketing degrees from the University of Michigan, I read with great interest your most recent Program for Management article, "Managing Our Markets" (June 17, page 93).

You have done a superb job in concisely presenting the essential aspects of such a broad field as marketing. I would like eight reprints.

Morgan Ramsay Jr.
Vice President
Bay City Shovels Inc.
Bay City, Mich.

May we have a reprint? It looks as though STEEL is on the way to another award for this 1957 series.

Charles O. Parrott
Advertising Manager
G. O. Carlson Inc.
Thorndale, Pa.

I would appreciate two copies of this excellent article.

C. H. McCollam
Steel & Tube Division
Timken Roller Bearing Co.
Canton, O.

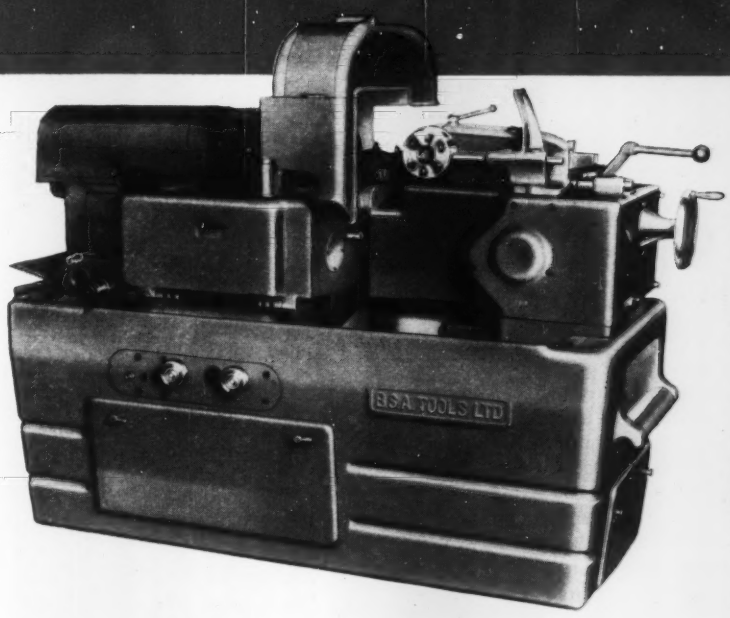
English Reader Likes STEEL

Being way down on the circulation list for STEEL at the works of the South Durham Steel Co. Ltd., Cargo Fleet Works, it is months before I have the opportunity to see it. Although the articles on ironmaking and ore preparations are of prime interest to me as a

(Please turn to page 12)

BSA first to provide UNIT REPLACEMENT of parts subjected to most wear

to keep important production flowing with new machine performance



With speeds, machining accuracy, ease of tooling and operation and maintenance equal or superior to any machine in its classification, BSA Single Spindle Automatic Screw Machines offer a very definite plus value through *"unit construction and replacement"* of work spindles, side slides, turrets and gear boxes.

Unit construction, plus extremely rigid, one-piece machine frame makes it possible to bring BSA machines back to factory standards of perfection quickly. You place an important unit back in the line with a minimum of lost production.

Shipment of replacement parts are speeded to you from National Acme, in Cleveland. Here, also, full engineering and design services as well as demonstration and service facilities, in the National Acme tradition, are available to you.

May we explain how *"unit construction and replacement"* can ease your production problems?

Additional Production Advantages of BSA

FIVE STANDARD CAPACITIES: ½" ¾", 1", 1⅝", and 2".

WIDE RANGE OF SPINDLE SPEEDS—200 to 6000 on ½" machine, 69 to 1260 on 2" model.

Cams, change gears and tooling easily accessible FOR QUICK JOB-TO-JOB CHANGEOVER.

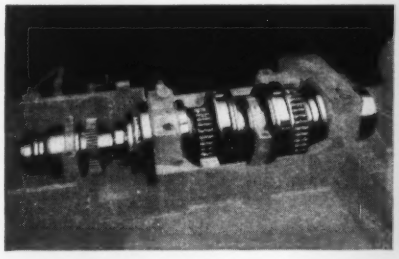
Unit construction provides quick access for EASY MAINTENANCE.

Special spindle mounting, DESIGNED TO REDUCE WEAR.

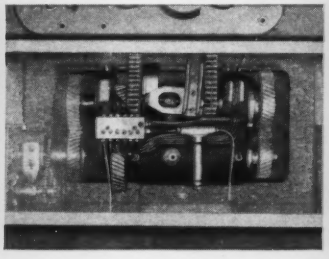
Positive chain drive from gear box to spindle PREVENTS SLIPPAGE.

All models use STANDARD AMERICAN TOOLING

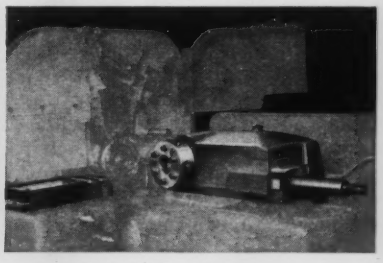
UNIT CONSTRUCTION SPEEDS REMOVAL OR REPLACEMENT



Work Spindle



Gear Box



Side Slides and Turret

Distributed and Serviced in U.S.A. by...

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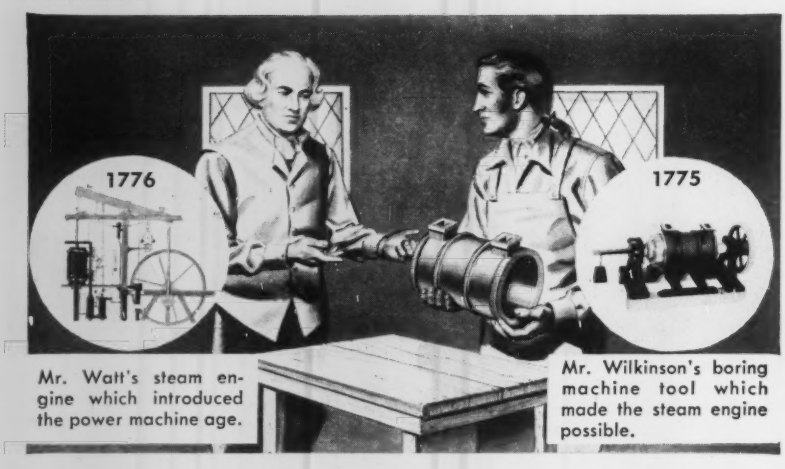


Mr. Watt's steam engine which introduced the power machine age.

Mr. Wilkinson's boring machine tool which made the steam engine possible.

This is Your Way of Life

MR. JAMES WATT: "For 10 unsuccessful years my steam engine was delayed—waiting for this day when there would be a means for accurately manufacturing the cylinder."

MR. JOHN WILKINSON: "The machine tool I have developed will not only make the cylinder perfectly round and without taper from end to end, it will also make many of them all alike. And, with your engine to drive my machine, there will be a new era—low cost production of large quantities of identical things."

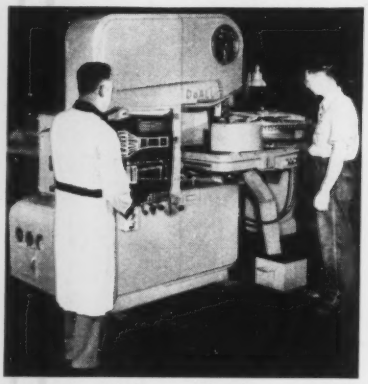
These historic parallel developments of metal-working and mechanical power introduced a new social order of mass production and mass consumption.

From that day to this, the same process has been going on. The early steam engine has given way to huge steam turbines which generate electrical power. The early machine tools have given way to complex automatic machines with amazing speed and accuracy. Thus, Americans turn out for themselves low-cost cars, TV sets, typewriters, home appliances and printing presses. Besides, their abundant productivity provides wealth and leisure that is the envy of the world.

To continue to provide improved living for all people in our growing population, requires a constant upward thrust of capital spending for expanding these facilities. Any one or any thing that retards this process is committing an economic crime against the American people.

"Tools" for improving living are the business of The DoALL Company. Although specializing in sawing, grinding and lapping machines, 38 local DoALL sales-service stores also offer industry more than 1500 cutting tool, gaging and supply items.

Like Wilkinson's and Watt's teamwork, here is a modern engine being machined with a modern machine tool.



Jet engine blades machined on a DoALL band machine. Other DoALL models make tools and parts for everything from cars to cameras.

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LETTERS

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Sales Director-Wire Division
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Franklin Balmar Corp.
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James T. Gow, Sr.
Vice President-Mfg. & Engineering
Sandusky Foundry & Machine Co.
Sandusky, O.

Reader Questions Turnover

In your article No. 4 in the 1957 Program for Management, "Inventory Management" (May 13, page 109), you state: During five business cycles between the World Wars, average changes in inventory investment were 32.4 per cent as large as changes in gross national product (GNP).

This seems hard to understand. Could you give me more background on how you reached this conclusion, as well as the fact that during inventory contractions, average declines constituted 47 per cent of the drop in GNP?

W. J. Cornelius
A. B. Murray Co. Inc.
Elizabeth, N. J.

• *The conclusions were made by the National Bureau of Economic Research, as a result of a study of government inventory figures as they related to GNP.*

GNP results from inventory investment. When GNP falls, inventory investments must naturally fall, too, and vice versa. Inventory contraction is usually more pronounced proportionately than the GNP fall. The ideal situation would be one in which inventories rose or fell at about one-third the rise or fall in GNP.

Precision parts made at Cramer Controls Corporation are used in washing machines, dryers, and in the electronics field. Here, B. F. Kimball, Gulf Sales Engineer, checks fine machined finish of such parts with Wallace Perzanoski, Foreman. The cutting oil: Gulfcut 31A.

Closer tolerances, longer tool life with GULFCUT!

Cramer Controls Corporation, Ballouville, Connecticut, makes precision parts for Cramer synchronous motors and electrical timing devices. For the past 2 years this plant has used Gulfcut 31A in its battery of Browne & Sharpe automatic screw machines . . . with excellent results.

"Gulfcut 31A," according to Wallace Perzanoski, Foreman of the automatic screw machines, "gives us excellent tool life—which of course has helped us boost production—and helps us hold to closer tolerances."

Other users of Gulfcut 31A cite such benefits as reduction in number of rejects, finer finishes, and lower machining costs.

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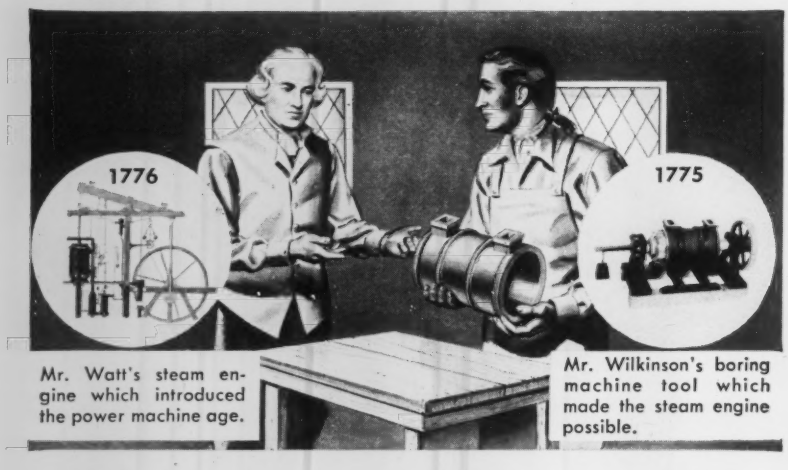

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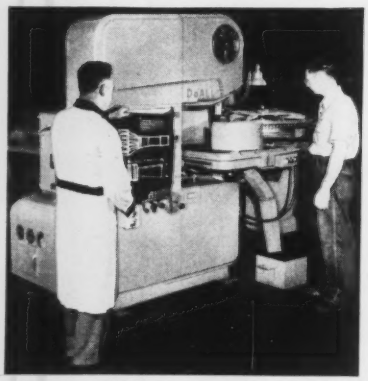

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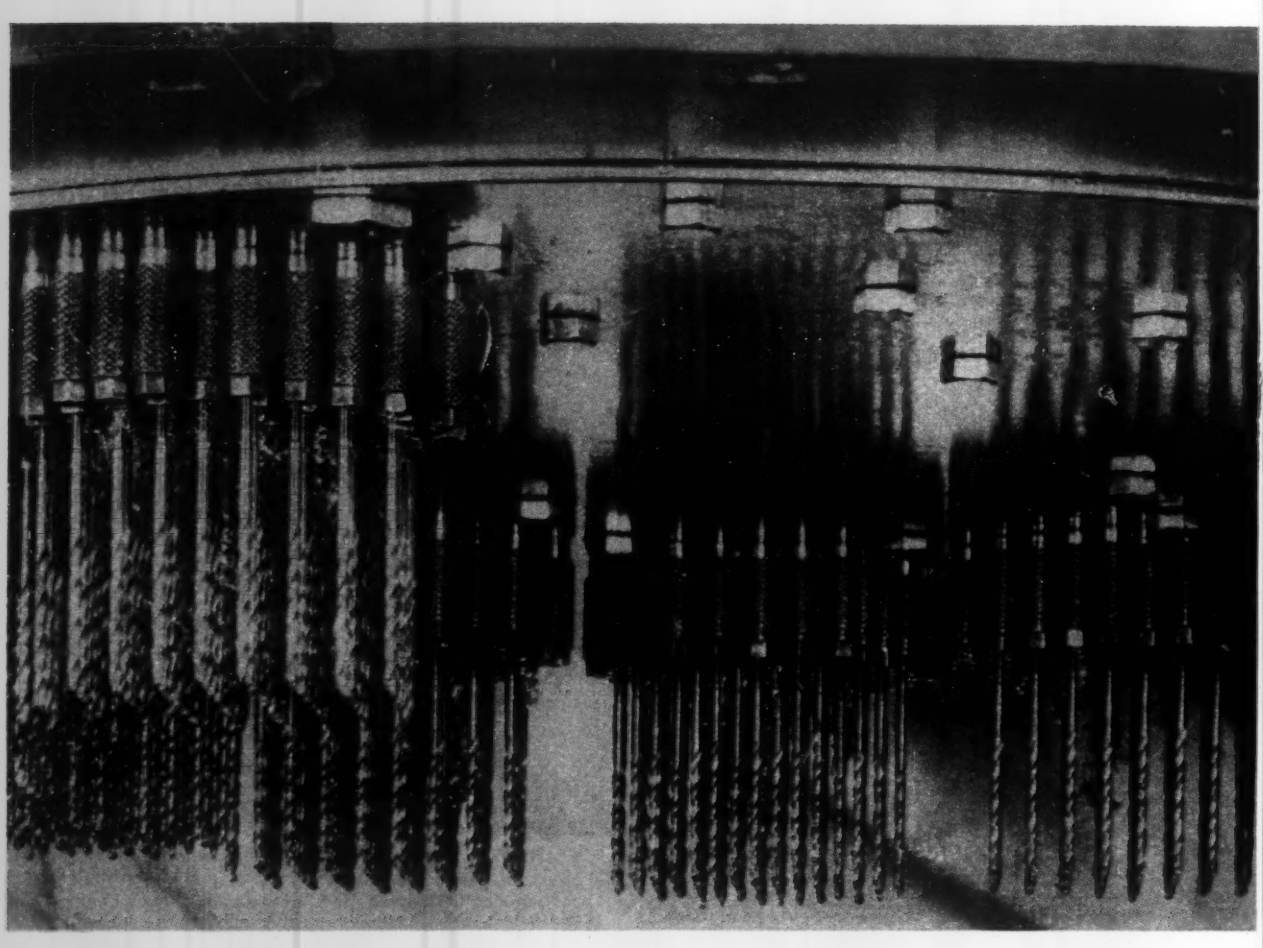

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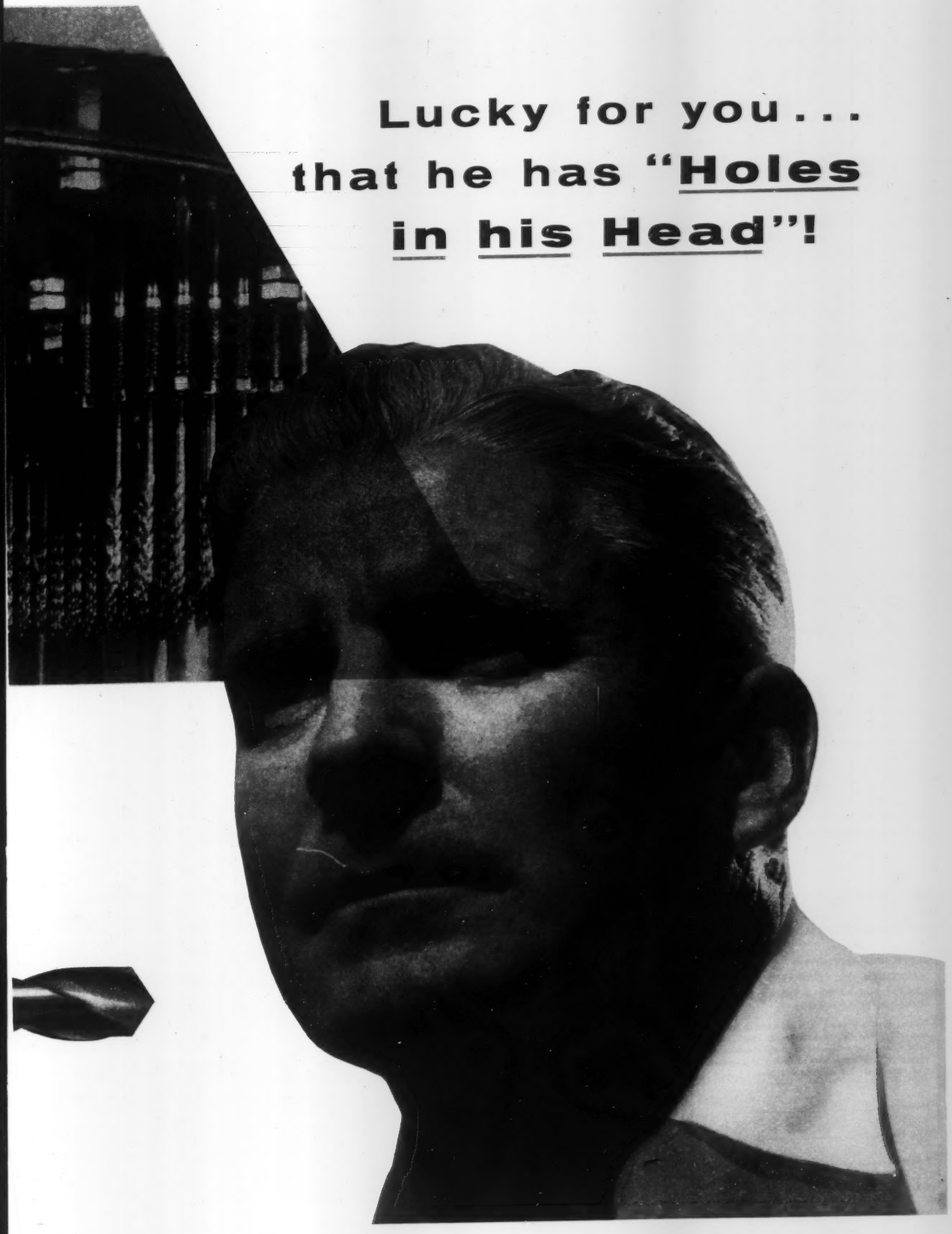

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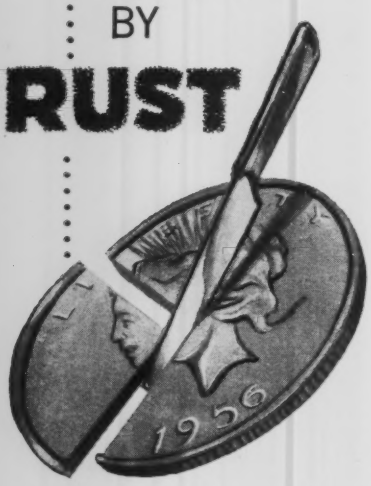

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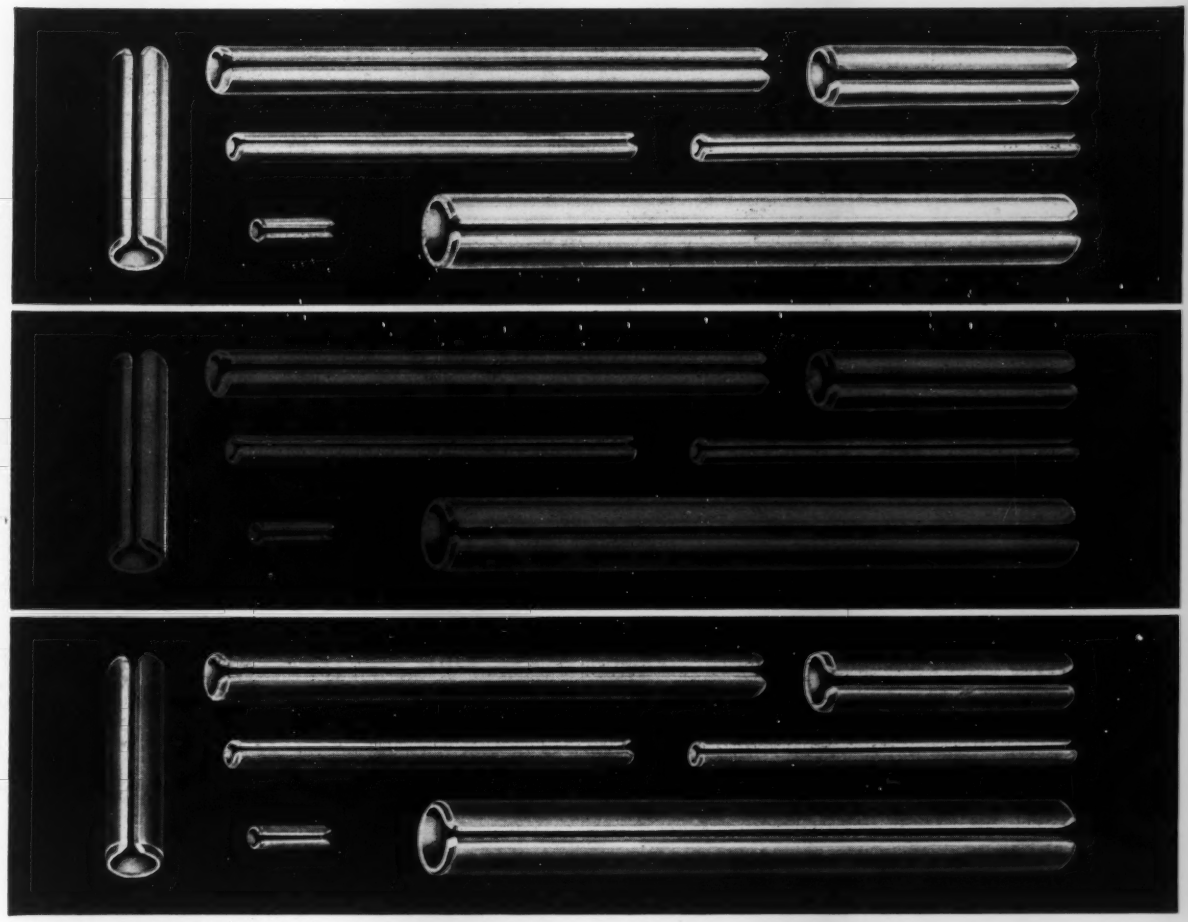

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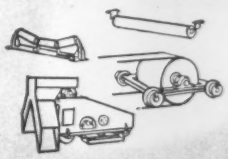

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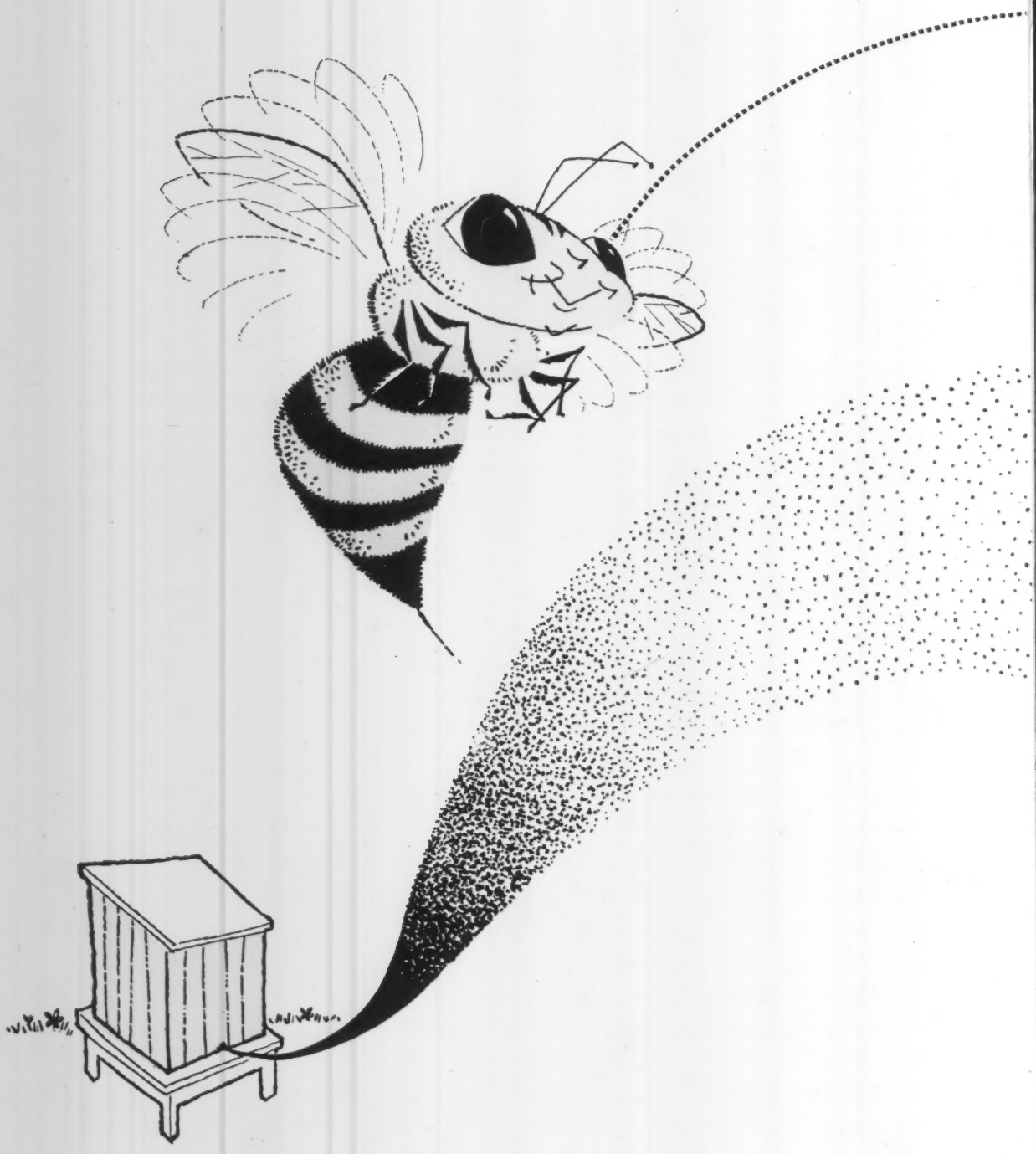

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No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
Signal Corps Wire
Spoke Wire
Hard Drawn Spring Wire
Oil Tempered Wire
Spheroidized or Annealed Spring Wire
Tire Bead Wire
Valve Spring Wire

MANUFACTURERS LOW CARBON COARSE WIRE
Bag Tie Wire
Basket Handle Wire
Box Binding Wire
Brush Handle Wire
"Cal-Tie" Wire
Can Key Wire
Case Hardened Ball Wire
Chain Wire
Clamp Wire
Clothes Pin Wire
Concrete Wall Reinforcement Wire
Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
Pail Bail Wire
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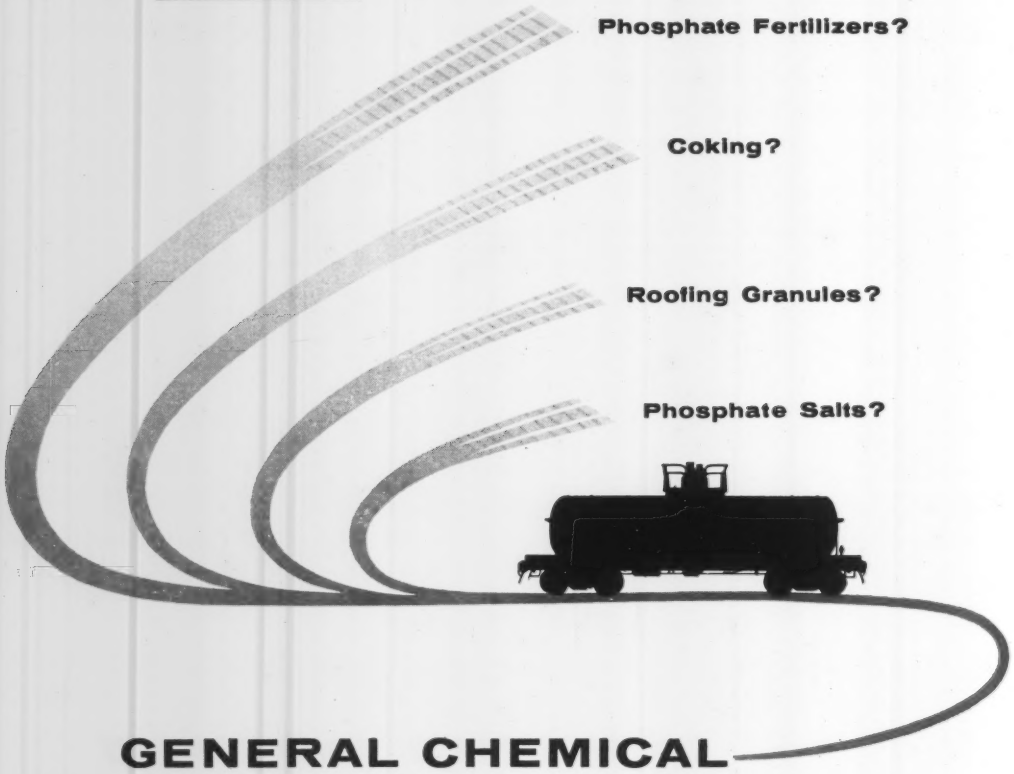

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Now, America's foremost producer of mineral acids offers industry a superior commercial grade of wet process Phosphoric Acid.

Not a by-product! General Chemical Phosphoric Acid is made especially for such uses as the manufacture of phosphate salts, fertilizers (liquid, granulation, enrichment, etc.) and other applications. It is specially treated to remove the excessive amounts of sulfuric acid, fluorine and silicates found in ordinary fertilizer-grade phosphoric.

It will pay you to see General Chemical now for your requirements if you are using phosphoric acid or anticipate a future need. For samples, prices and other data, phone or write your nearest General Chemical sales office.

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CALENDAR
OF MEETINGS

July 16-17, Truck-Trailer Manufacturers Association: Summer meeting, Homestead, Hot Springs, Va. Association's address: 710 Albee Bldg., Washington 5, D. C. Secretary: John B. Hulse.

July 24-27, National Tool & Die Manufacturers Association: Summer meeting, Grove Park Inn, Asheville, N. C. Association's address: 907 Public Square Bldg., Cleveland 13, O. Executive secretary: George S. Eaton.

Aug. 12-15, Society of Automotive Engineers: West coast meeting, Olympic hotel, Seattle. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 20-23, Western Electronic Show & Convention: Cow Palace, San Francisco. Information: WESCON, 342 N. LaBrea, Los Angeles 36, Calif.

Aug. 28-30, American Institute of Electrical Engineers: Pacific general meeting, Chinook hotel, Yakima, Wash. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Sept. 8-11, National Metal Trades Association: Eastern plant management conference, Essex-Sussex hotel, Spring Lake, N.J. Association's address: 337 W. Madison St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

Sept. 9-11, American Mining Congress: Metals mining and industrial minerals convention, Utah and Newhouse hotels, Salt Lake City, Utah. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president and secretary: Julian D. Conover.

Sept. 9-12, Society of Automotive Engineers: Tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N.Y. Secretary: John A. C. Warner.

Sept. 9-13, Instrument Society of America: Annual instrument - automation conference and exhibit, Public Auditorium, Cleveland. Society's address: 313 Sixth Ave., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 12-14, Automotive Parts Rebuilders Association: Annual meeting and exhibit, Congress hotel, Chicago. Association's address: 220 S. State St., Chicago 4, Ill. Executive secretary: Jack O'Sullivan.

Sept. 17-20, American Die Casting Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

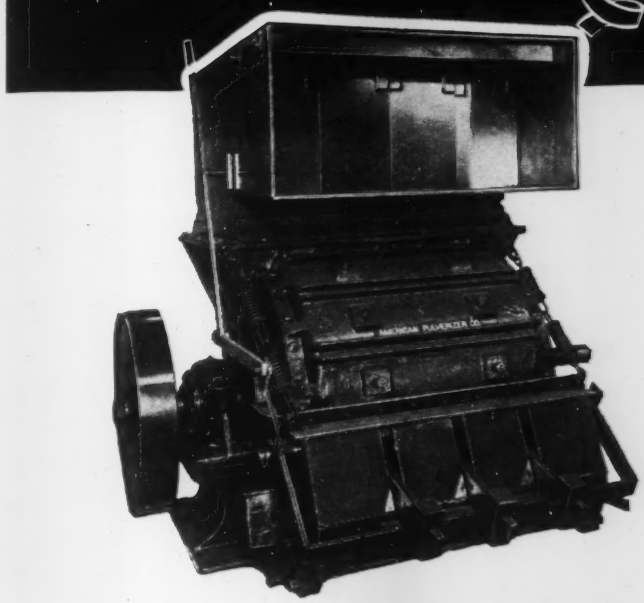
Sept. 18-20, National Industrial Conference Board: Marketing meeting, Waldorf-Astoria hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Sept. 21-24, Steel Founders' Society of America: Fall meeting, Homestead, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, O. Secretary: George K. Dreher.

Sept. 22-24, American Machine Tool Distributors Association: Annual meeting, Hotel Cleveland, Cleveland. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelly.

Sept. 22-25, American Institute of Wholesale Plumbing & Heating Supply Association Inc.: Annual meeting, Waldorf-Astoria hotel, New York. Institute's address: 402 Albee Bldg., Washington 5, D. C. Executive secretary: George T. Underwood.

Here's A Curly Cue
To New Market Value
For Your Machine Turnings



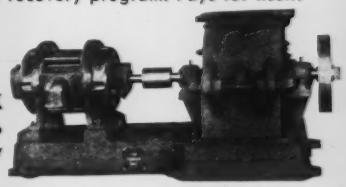
American METAL TURNINGS Crusher

That single machine turning of curled-up steel shown above can be mighty troublesome and costly to your operations.

Gnarled up with thousands of others like itself, it becomes a problem in space . . . gallons of re-usable cutting oil are trapped in the folds . . . and the scrap value is greatly minimized.

Answer? Run this tangled waste through an efficient, AMERICAN METAL TURNINGS CRUSHER. Out come sized ships that are easy to handle for shoveling or pneumatic handling . . . easy to store (savings in space up to 75%) . . . easy to spin for oil recovery . . . and crushed turnings command a higher price.

The cost is easy, too, on your scrap recovery program. Pays for itself. WRITE for illustrated literature.



RECLAIM FUSED WELDING FLUX
American Hammermill reduces fused flux to fine regranulation for perfect re-use. Why throw away profits! Details on request.

WRITE for Coal Crushing Bulletin

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
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CLEVELAND STANDARD HEXAGON HEAD CAP SCREWS

Extra fastener muscle for mighty earth-moving machines

Power shovels, trucks, bulldozers—all take brutal shock loads and vibration, day in, day out. To reduce repairs and downtime to a minimum, leading manufacturers of earth-moving equipment specify Cleveland cap screws with confidence. These upset forged hexagon head cap screws put extra strength into every assembly, insure customer satisfaction.

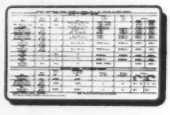
Cleveland standard hexagon heads are manufactured from various steels and in various tensile strengths. Included are extra-large diameters and long lengths. Bright and quenched and tempered steels in all standard sizes are ready for immediate delivery—alloy steels on short notice. Let our experienced engineers help you with your fastener problems. Remember, Cleveland has the most modern of production facilities and the world's largest stock of hexagon head cap screws.

TENSILE STRENGTHS OF CLEVELAND HEXAGON HEAD CAP SCREWS

Product	Size, in.	Tensile Strength, psi
Bright	Up to 7/8 incl. 1/2 to 1 1/8 incl. Over 1 1/8 to 1 1/2 incl.	85,000—105,000 75,000—100,000 65,000 min.
Quenched & Tempered (SAE Grade 5)	Up to 3/4 incl. Over 3/4 to 1 incl. Over 1 to 1 1/2 incl.	120,000 min. 115,000 min. 105,000 min.
Quenched & Tempered (SAE Grade 6)	Up to 5/8 incl. Over 5/8 to 3/4 incl.	140,000 min. 133,000 min.
Alloy (SAE Grade 7)	Up to 1 1/2 incl.	130,000 min.
Alloy (SAE Grade 8)	Up to 1 1/2 incl.	150,000 min.
Bright	Over 1 1/2 to 2 1/2 incl.	55,000 min.
Quenched & Tempered	Over 1 1/2 to 2 1/2 incl.	90,000 min.
Alloy	Over 1 1/2 to 2 1/2 incl.	125,000 min.

Note: Higher physicals, through use of selected alloys, can be supplied on special order.

GET YOUR COPY NOW — Pocket-size card giving you physical properties of Cleveland hexagon and socket head cap screws and Cleveland Place bolts.



THE CLEVELAND CAP SCREW COMPANY
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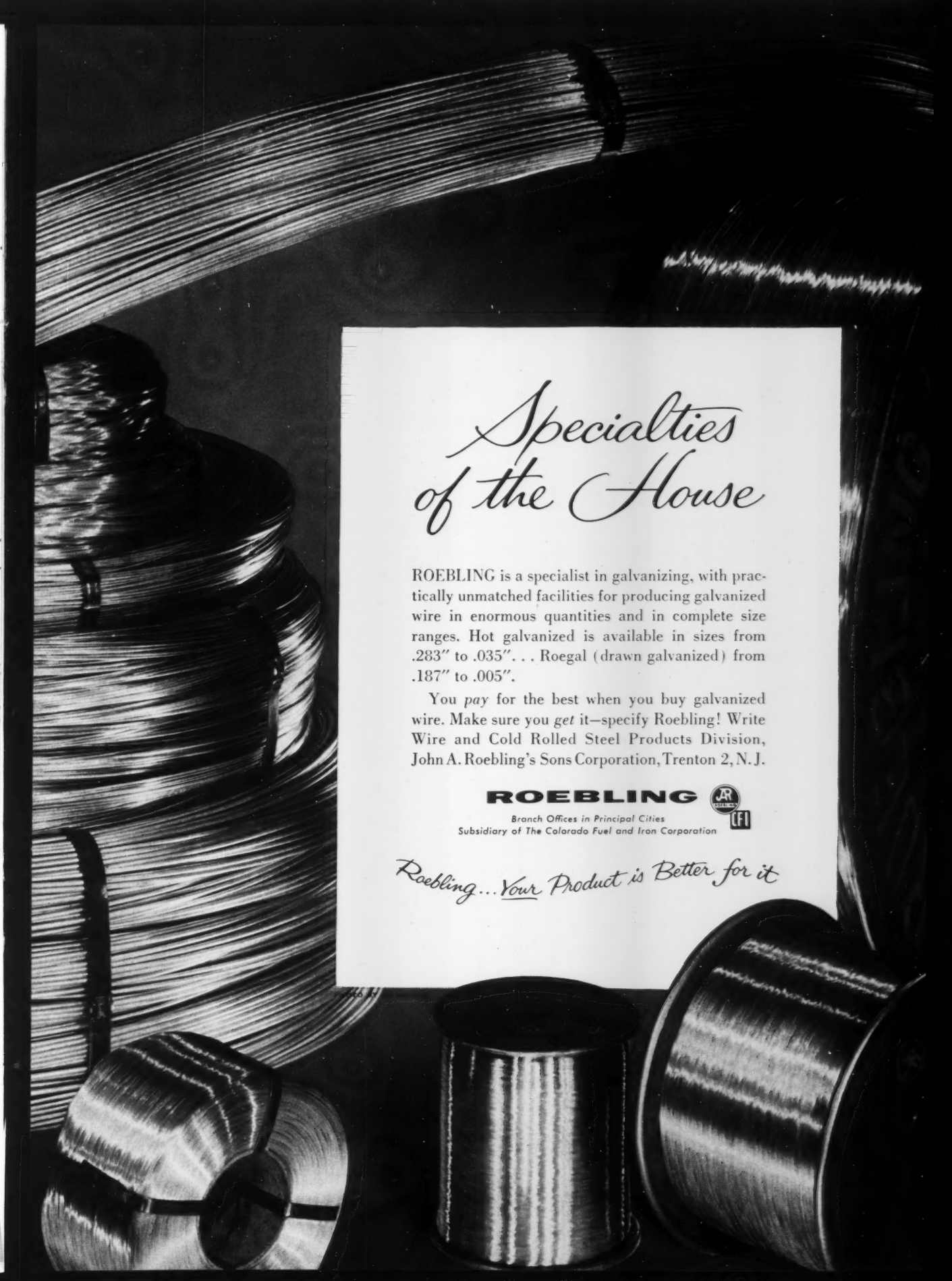
WAREHOUSES: Chicago • Philadelphia • New York • Los Angeles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ROEBLING is a specialist in galvanizing, with practically unmatched facilities for producing galvanized wire in enormous quantities and in complete size ranges. Hot galvanized is available in sizes from .283″ to .035″. . . Roegal (drawn galvanized) from .187″ to .005″.
You pay for the best when you buy galvanized wire. Make sure you get it—specify Roebling! Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.
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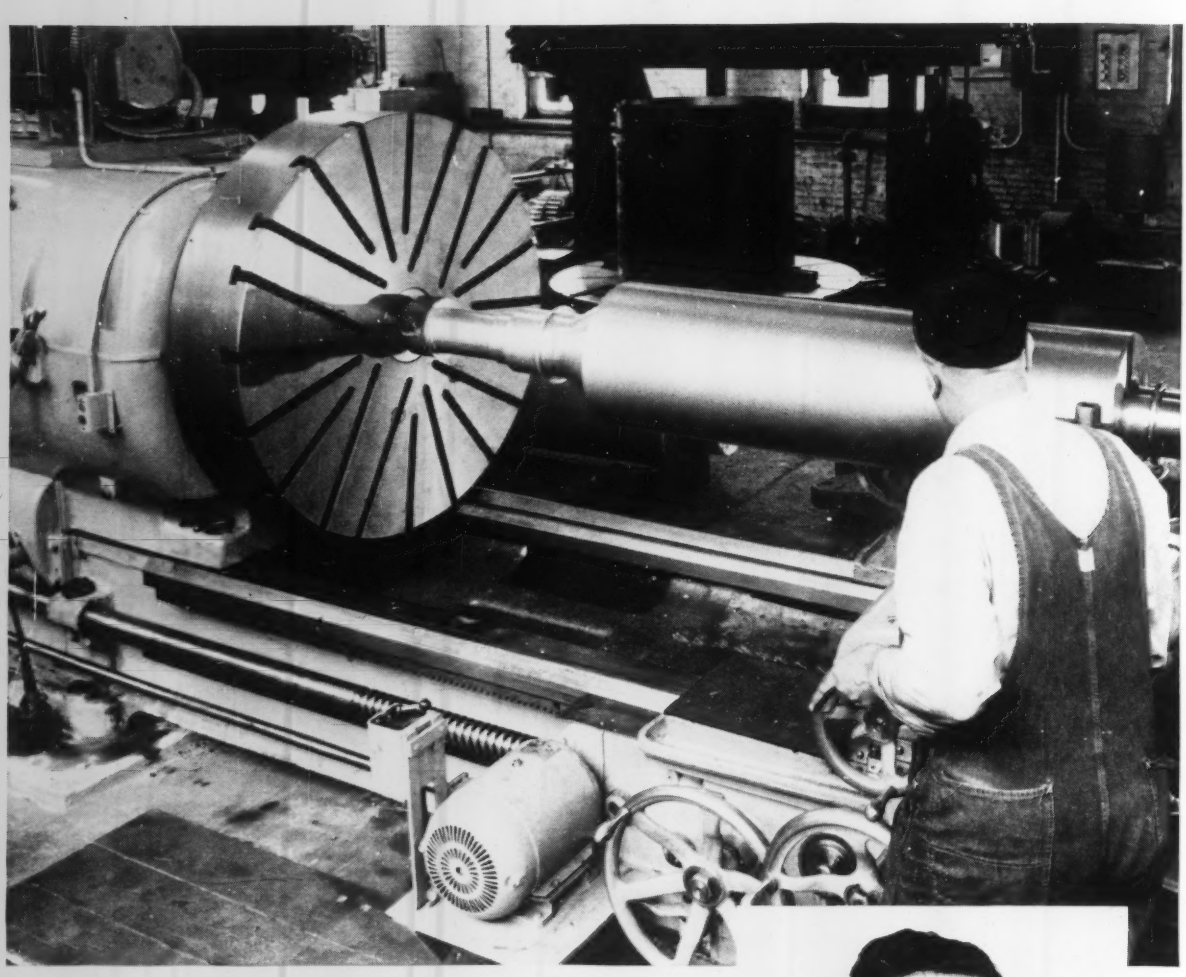

"Standard Steel castings and forgings play an important role in the 'New Look' at Vulcan Iron Works"

We at Standard Steel Works feel justly proud of the fact that our castings and forgings play "an important role" in both the quality and service which our several hundred customers are rendering to *their* customers. Vulcan Iron Works is typical of our customers—it consistently meets the quality and delivery requirements of its customers, and knows it can rely on us to help maintain its leadership as rotary kiln manufacturers.

Why don't you present your next forging or casting requirements to us. You too will find that when we at Standard Steel Works say that we give equal emphasis to quality *and* service to our customers, we mean what we say. Write Dept. 2-G.

"When the new management took over at Vulcan, it immediately recognized the importance of better customer relations through faster deliveries and lower selling costs. Standard Steel's prompt service and quality products are helping Vulcan realize these objectives," says Mr. William J. Davis, plant superintendent, Vulcan Iron Works, Wilkes-Barre, Pa.

Standard Steel Works Division

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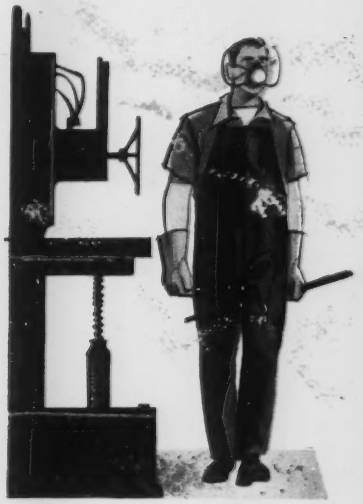
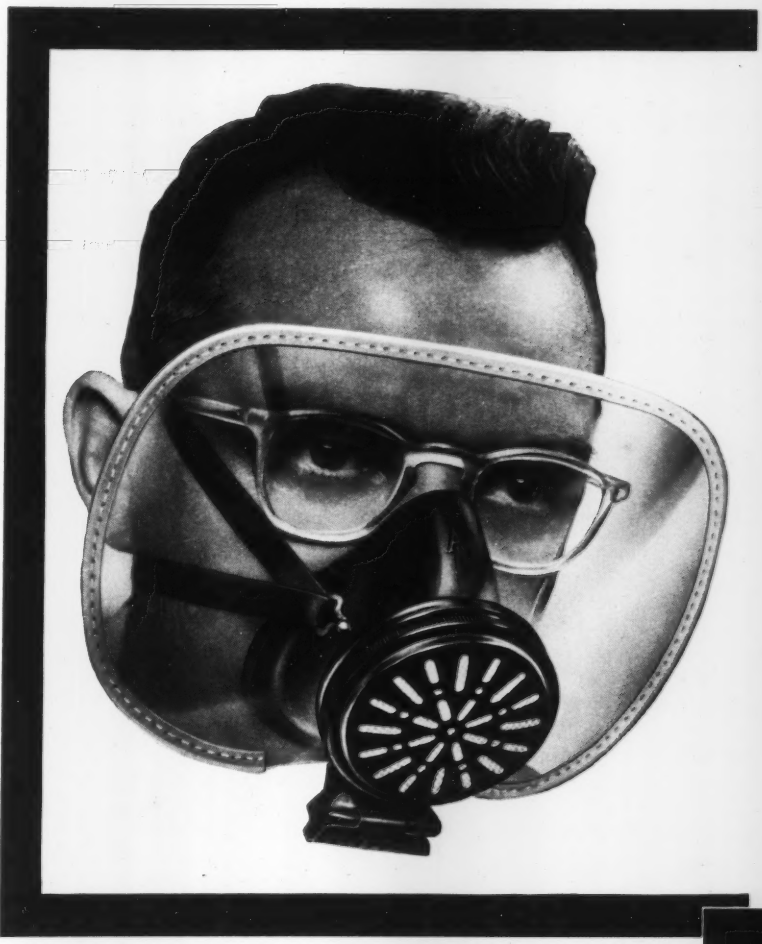
Give your Workers BOTH

Respiratory and Facial Protection

This Easy, Practical Way!





AO R2000 RESPIRATOR with R18 FACE SHIELD

The R2000 Respirator you know about — it's industry's preferred single cartridge respirator that gives you eight respirators in one basic face piece to handle a multitude of dusts, fumes and mists — singly and in combination.

The R18 is a highly adaptable face shield specifically designed for wear with the R2000. Light in weight, durable, easy to attach, it protects eyes and upper face against frontal attack of flying particles. Window is plastic or cellulose acetate .020″ thick. Outer edges are protected by vinyl plastic binding for longer shield life. Shield may be worn over regular safety prescription glasses.

Recommended wherever comfortable DOUBLE protection is desired such as in light chipping, light grinding, light scraping, polishing, painting. Your nearest American Optical Safety Products Representative can supply you.

Always insist on AO Trademarked Safety Products

American Optical
COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS
BRANCHES IN PRINCIPAL CITIES

Cargotainer's half-drop end enables Group Leader William Moriarty to remove individual parts from storage without lift truck. Wire mesh construction affords quick identification of contents—speeds production.

Pittsburgh Cargotainers and Pallets

Give 21% More Storage Space Cut Maintenance $10,000 at Stromberg-Carlson

Robert W. Sparkes, section head of 17-member group whose studies resulted in use of Pittsburgh Cargotainers and pallets in Stromberg-Carlson plant, discusses their advantages with Production Engineer Floyd Shares (left).

Substantial savings in space and materials handling costs have been achieved at Stromberg-Carlson by the introduction of Pittsburgh Cargotainers and Pallets into their materials handling system to meet the demands of expanding electronics production.

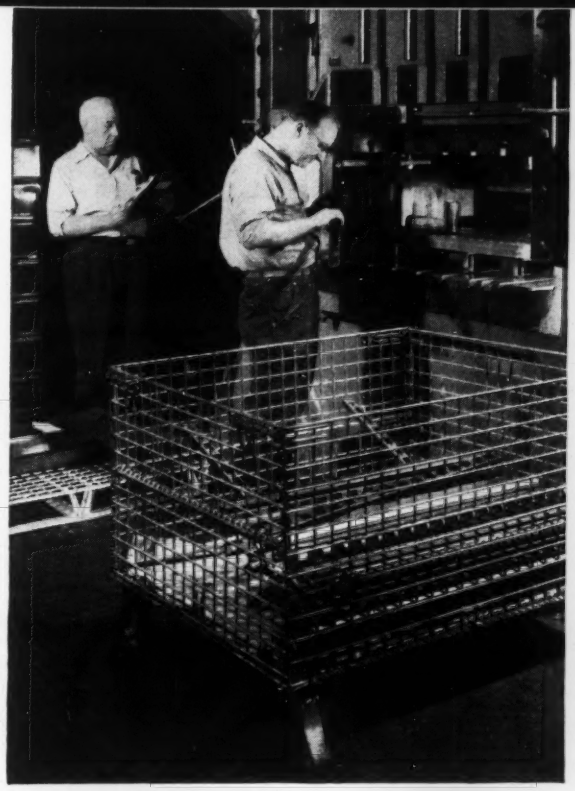
While business volume has tripled, this division of General Dynamics Corporation was only able to double its warehouse floor area. Yet with Cargotainers, they have increased storage area by 21%. Sturdy, collapsible, welded steel wire mesh Cargotainers also guard millions of delicate parts from damage in storage and in transit. They replace wooden boxes previously used which collected oil, dirt and debris—had to be cleaned periodically.

Pittsburgh Pallets, made of the same steel mesh, save the company $10,000 a year in maintenance which was spent in replacing and repairing wooden skids. They cost only half as much as wooden skids on a service-life basis.

Advantages of changing from wooden boxes and skids to steel mesh Cargotainers and pallets are explained by Robert W. Sparkes, section head of Stromberg-Carlson's 17-member methods improvement group who said:

"Cargotainers pay for themselves through the visual inventory they provide, their durability and the ease with which they are handled. With Cargotainers, workers can tell at a glance what's in them. Maintenance has been zero in the four years they've been in use here.

(Advertisement)



Material to be formed into electronic amplifier chassis arrives at this 300-ton press on Pittsburgh pallets. After forming, the same load is transported in Cargotainers to various finishing departments.

Concave stacking cups in steel legs permit Cargotainers to be tiered easily and safely. Stromberg-Carlson gained 21% storage area through use of Cargotainers which can be collapsed when empty for ease of storage.

"The old wooden skid boxes provided only two-way entry. Cargotainers give eight-way entry which reduces the necessity for excess maneuvering by lift trucks.

"Half-drop ends enable employes to take parts from tiered Cargotainers without having trucks move them. Solid construction of wooden containers made it impossible to remove parts unless a truck was used, and of course you couldn't see in them without climbing.

"Wooden boxes had the same disadvantages as wooden skids. They became oil soaked, causing nails to pop out. This sometimes caused support boards to collapse, spilling costly and fragile loads. As oil collectors, both the boxes and skids posed a fire hazard. Splinters and protruding nails were liable to cause injury to employes. All these ills were cured by steel mesh Cargotainers and pallets.

"Cargotainers and pallets are used in combination by us. Both have the same base size and we use them in any number of ways. For example, we move flat stock to a production area on pallets. After forming, we move the same amount to a storage area in a Cargotainer."

This is but one typical example of how manufacturers are reducing handling costs, increasing storage space and speeding production through use of Pittsburgh Cargotainers and pallets.

Successful users include foundries—automotive parts and assembly plants—textile mills—aircraft plants—railroads for mail handling—appliance manufacturers—farm implement plants—even meat packers.

Many more case histories of how Cargotainers have been engineered into other materials handling systems, plus data on standard and special models, are contained in a new Pittsburgh Steel Products manual. This 32-page booklet is yours for the asking. Contact any of the district sales offices listed below or write directly to Pittsburgh Steel Products Division, Pittsburgh Steel Company, Grant Building, Pittsburgh 30, Pa.

Cargotainers®

by Pittsburgh Steel Products

a division of Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

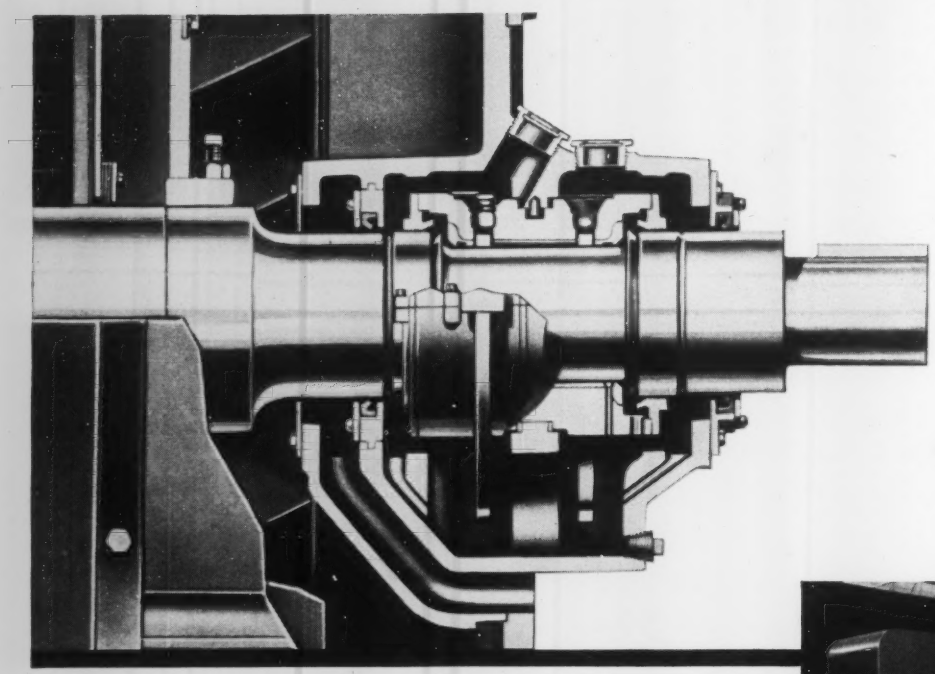
District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

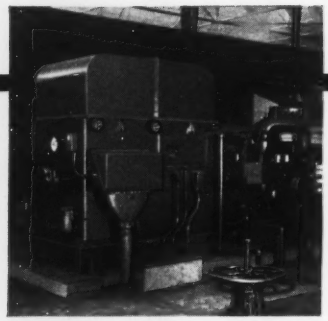
(Advertisement)

One of the many reasons why **ALLIS-CHALMERS MOTORS** operate dependably in the

METAL WORKING INDUSTRY



Motor Bearing is pressure-equalized with vent



Two-pole motor driving descaling pump.

SHAFT seals and a pressure-equalizing vent give double protection against oil leakage from this Allis-Chalmers motor bearing. First, seals keep oil inside the enclosure. Second, the pressure-equalizing vent chamber maintains atmospheric pressure at the inboard side of the bearing, so that fan action won't pull oil vapors out of bearing, under any conditions. This double protection assures oil-free motor interior and drip-free operation.

Accessible, Too!

Motor inspection is easy with capsule-type bearing housings. Upper halves of motor end shield and inner air baffle can be removed without opening the bearing enclosure or disturbing bearing alignment.

For details on these and other features of Allis-Chalmers motors, call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

A-5478

YOUNGSTOWN QUALITY PAVES THE WAY

Producers of Quality Carbon and Alloy Steels for over Half-a-Century

The Motor Grader and Tractor-Scraper—shown working on the site of Houston's multi-million-dollar "Shopping City of Gulfgate", are designed for rugged service requiring tough strong steel construction.

Caterpillar Tractor Co. uses Youngstown quality steels in the construction of these powerful machines. Youngstown Alloy Steel for the gears of the steering and driving mechanisms help to provide durable, trouble free mechanical operations. Yoloy "M" Steel Plates, one of the Yoloy family of high strength steels, are used for structural strength, resistance to shock and abrasion and also for ease in forming and welding the many intricate parts in this type of fabrication.

Youngstown's Alloy and Yoloy Steels are produced in a variety of forms and qualities to meet your particular specifications. Our Service Engineers are available upon request to discuss your Alloy and High Strength steel problems—why not call them today.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

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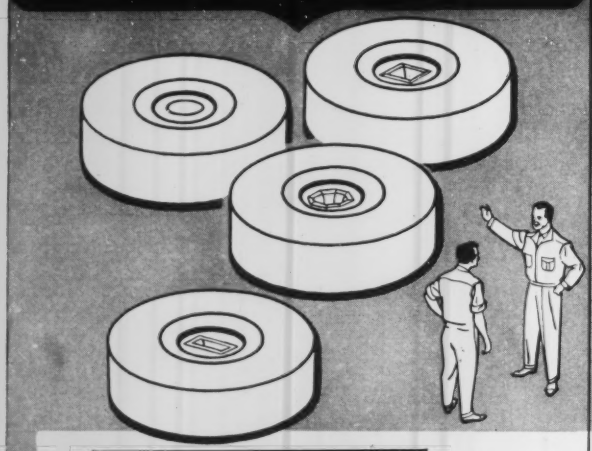
A New and Better Chrome Carbide

CARMET Grade CA-815

FOR HOT EXTRUSION DIES



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because of . . . High resistance to oxidation at elevated temperatures.

BETTER SIZE CONTROL
because of . . . Excellent wearability.

BETTER BAR FINISH
because of . . . High hot hardness.

LESS PICKUP AND GALLING
because of . . . Less affinity towards other metals.

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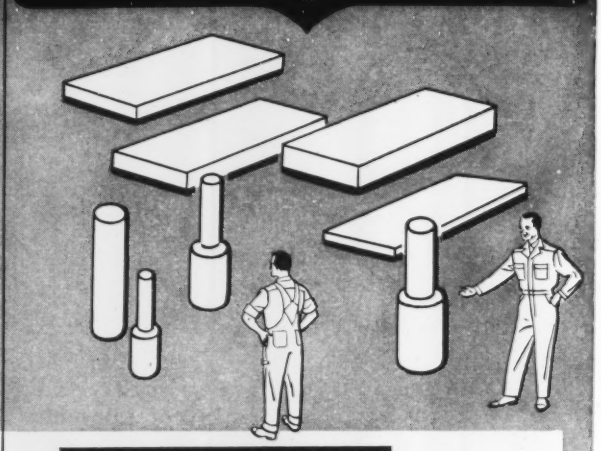


BETTER RESULTS

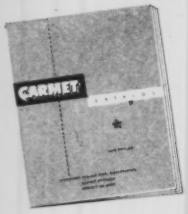
MORE ACCURATE GAGING
because of . . . Coefficient of expansion close to that of steel.

EXCELLENT SURFACE FINISH
because of . . . Low porosity.

EASY MAINTENANCE
because of . . . High resistance to corrosion.

LONGER GAGE LIFE
because of . . . Excellent wearability.

Write for the NEW
CARMET CATALOG



. . . Completely revised, the 16th Edition of the Carmet Catalog contains the latest information on all Carmet grades, and on Carmet blanks, tools, die sections, etc.; also gives details on special preforming and how to order special parts.

Address Dept. S-91

Now for the first time a completely homogeneous chrome carbide is available . . . Carmet CA-815. Grade CA-815 is ideally suited for such operations as the two illustrated above . . . or for *any* application where resistance to corrosion as well as resistance to abrasion are a factor.

Carmet CA-815 is manufactured under controlled conditions. Die and gage makers are assured of complete dimensional accuracy and excellent surface conditions. Only minimum amounts of stock are left for finishing.

For further information on this and other Carmet carbide grades, call your Carmet Engineer . . . or write *Allegheny Ludlum Steel Corporation, Carmet Division, Detroit 20, Mich.*

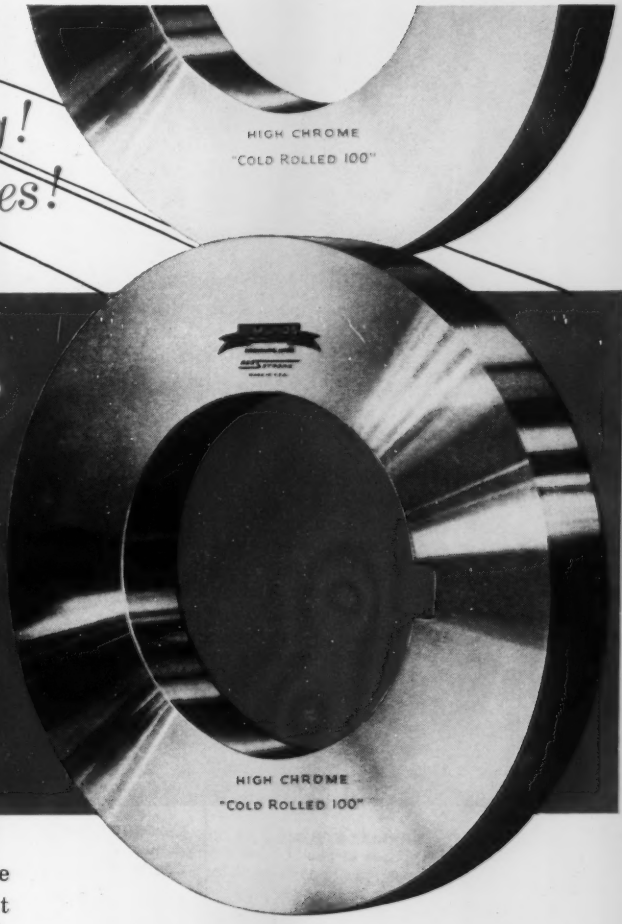
WSW 6159

For ALL your CARBIDE needs, call

Allegheny Ludlum

AL® FINE TOOL STEELS SINCE 1854

Lapped Surfaces!
Precision Grinding!
Keener Cutting Edges!



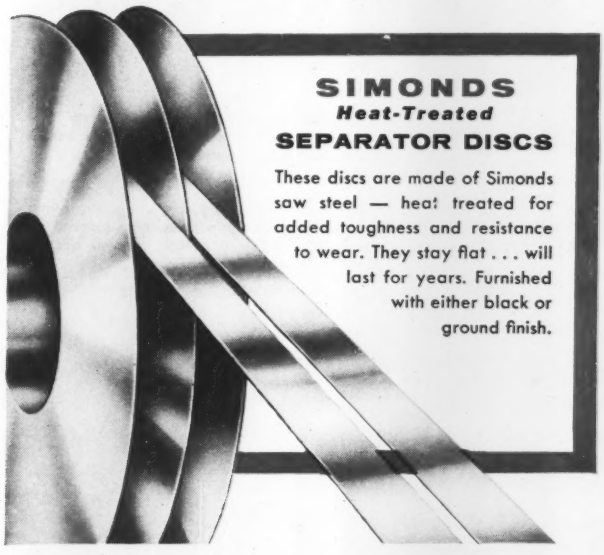
SIMONDS
RED STREAK
Forged ROTARY SHEAR KNIVES

Because you need clean, accurate slitting, we couldn't be fussier about the steel, the heat treating, the grinding and the accuracy of our Red Streak Shear Knives . . . and you get the cleanest, most accurate slitting around!

To begin with, we furnish the *right* Simonds Steel for each shearing application . . . High Chrome, Special Alloy or High Speed . . . forge it for added density and resistance to chipping and then precision grind for the utmost accuracy in operation.

On-the-job results prove the advantages of Simonds high grade tooling, both knives and spacing collars . . . advantages that mean savings in sharpening and replacement costs as well as in cleaner, more accurate slitting.

For the knives you need for your operations send today for the free "Shear Selector Chart" to help you cut costs as well as metal.



SIMONDS
Heat-Treated
SEPARATOR DISCS

These discs are made of Simonds saw steel — heat treated for added toughness and resistance to wear. They stay flat . . . will last for years. Furnished with either black or ground finish.

125 years of growth 1832-1957

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio
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Because the mortar

Harbison-Walker has more than 25 different

Refractory brick structures last longer when the bonding mortar matches the characteristics of the brick. The mortar should correspond with the brick in refractoriness, thermal expansion and other properties and should be compatible in chemical composition. To fulfill the requirements for the many different types and classes of refractory brick and operating conditions, Harbison-Walker produces more than twenty-five bonding mortars.

Included in this wide range are some mortars which set with a strong bond upon drying, which is retained at high temperatures, and others which acquire a good ceramic set only when heated. The

Some of the Various Types and Classes

BRAND	DESCRIPTION	TYPICAL APPLICATIONS
HARWACO BOND wet or dry	Cold-Setting with strong bond and negligible shrinkage—alumina-silica composition—more refractory than any mortar of fireclay base.	Used for laying all classes of fireclay and high alumina brick in boiler settings—kilns—oil refining units—metallurgical furnaces.
HARWACO MASTIC wet or dry	Corresponds to HARWACO BOND in composition—especially adapted for use in thick plastic consistency.	For pointing or sealing cracks in brickwork—as a protective coating—monolithic packing back of water-wall tubes—air duct linings.
CORALITE BONDING MORTAR wet	High alumina cold-setting cement of unusually high refractoriness.	For laying all classes of alumina-silica brick used at unusually high temperatures in contact with molten metals and various corrosive slags.
KORUNDAL BONDING MORTAR dry	Cold-setting bonding mortar containing approximately 85% alumina. Mineral composition mullite and corundum. Extremely high in refractoriness.	Used for laying all classes of high-alumina brick. Very resistant to corrosion by volatile alkalies and slags of certain metallurgical furnaces.
H-W CORUNDUM BONDING MORTAR dry	Substantially an all corundum cold-setting mortar of 99% alumina content.	The ultimate in refractoriness among high alumina mortars—used with greatest benefit at highest temperatures.
THERMOLITH dry	Chrome base cold-setting mortar. Highly resistant to many very corrosive fluxes.	Most extensively used for laying magnesite, chrome and forsterite brick. Also favored for use with fireclay and high alumina brick in many special applications.

HARBISON-WALKER REFRACTORIES COMPANY
AND SUBSIDIARIES
World's Most Complete Refractories Service
General Offices: PITTSBURGH 22, PA.

is as important as the brick . . .

Walker provides BONDING MORTARS

mortars with hot-setting properties contribute to flexibility in expansion and contraction of structures which are subjected to soaking heats throughout. Chemical compositions vary from highly basic, through various degrees of neutral to strongly acid, and in each specific case provide for maximum resistance of the joints to the widely different corrosive slags and fumes. Among these compositions are those consisting largely of magnesia, forsterite (magnesium silicate) chrome, corundum (stabilized crystalline alumina), silica and alumina-silica in various ratios.

Adequate refractoriness to secure the most durable and impervious joints and smooth-working plasticity with proper water retention are other properties of major importance for these mortars.

In addition to the different kinds described in the following table, Harbison-Walker produces others, including hot-setting mortars such as H-W FURNACE MAGNESITE, H-W SPECIAL FURNACE CHROME, H-W BONDING MORTAR and various brands of finely ground high duty and super-duty fireclays as well as several modifications of silica cements and mortars primarily for laying insulating fire brick.

From these bonding mortars can be selected those best suited for each specific application to secure longest furnace life and greatest economy.

of Harbison-Walker Bonding Mortars

BRAND	DESCRIPTION	TYPICAL APPLICATIONS
H-W FORSTERITE BONDING MORTAR dry	Strong cold-setting, magnesium silicate mortar of basic character.	For use at high temperatures with H-W FORSTERITE brick in glass-melting and various metallurgical furnaces.
H-W PERIKLASE BONDING MORTAR dry	Basic, highly refractory, cold-setting mortar used for laying H-W PERIKLASE and other basic brick.	Used in electric and open hearth steel melting furnaces, glass furnaces, rotary kilns.
FIREBOND dry	Siliceous cold-setting bonding mortar having the property of high resistance to siliceous slags.	Used for laying silica brick where strong bonded joints are desirable and with fireclay brick for dense impervious joints at moderate temperatures.
VEGA BOND dry	Hot-setting silica cement of super-duty quality. Non-shrinking and smooth working.	For laying and grouting conventional and super-duty silica brick in all their applications.
ANKORITE dry	High alumina hot-setting mortar possessing excellent working qualities. Provides flexibility to brickwork in soaking heats over an intermediate temperature range and a strong set at the furnace operating temperatures.	Used for laying super-duty and high duty fireclay brick and the various classes of high alumina brick where a highly refractory heat setting mortar serves to best advantage.
H-W WEATHERED BOND B CLAY dry	Hot-setting bonding mortar. Excellent plasticity and bonding qualities developed by a long weathering process.	Used with splendid results for laying fireclay brick in boiler settings, iron blast furnaces and stoves.

Use this coupon to get prices and additional information about Harbison-Walker Bonding Mortars

Harbison-Walker Refractories Co.
Pittsburgh 22, Pa.

Please send me prices and information about the following bonding mortar(s)

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NAME_____ POSITION_____

COMPANY_____

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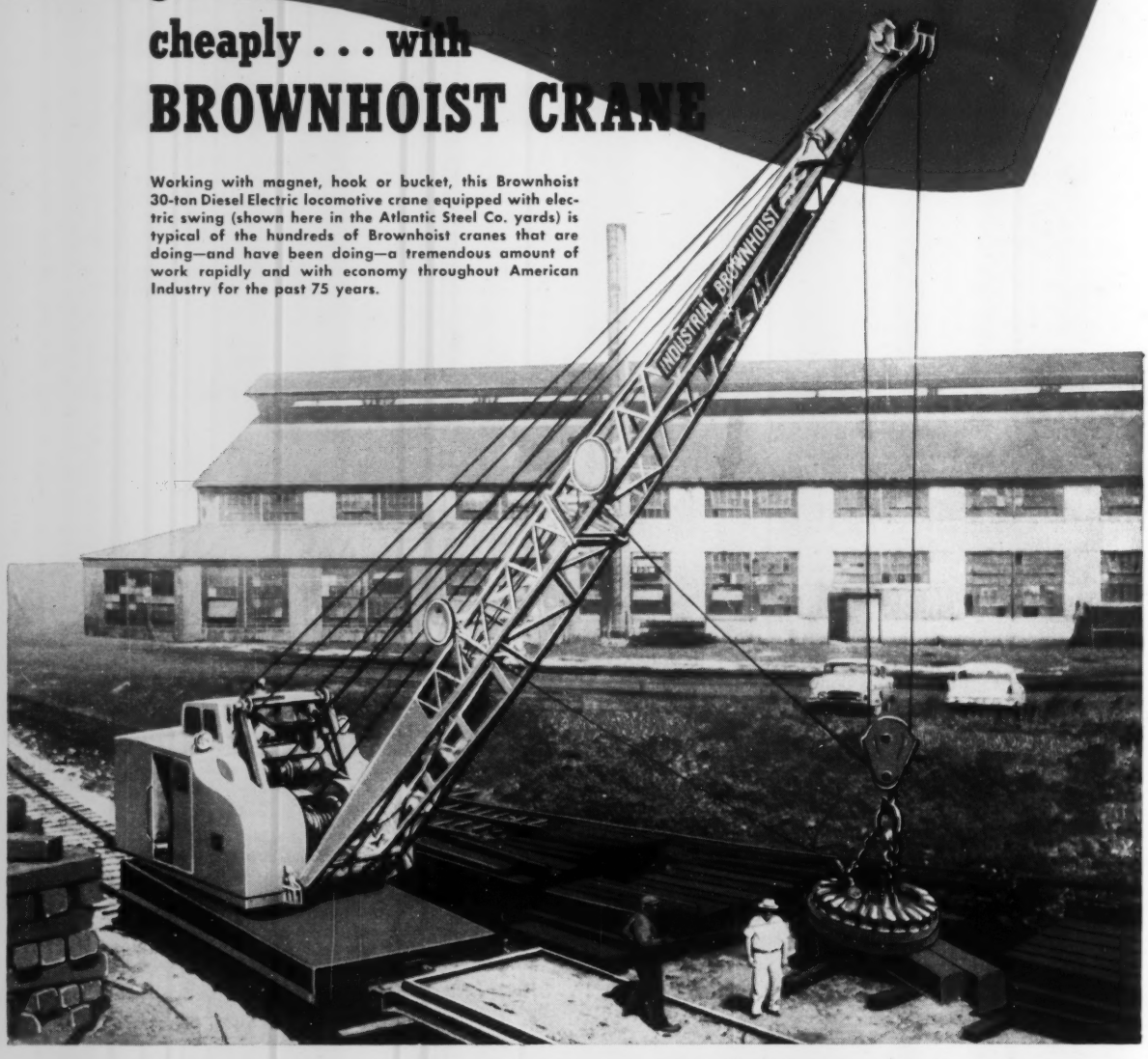
gets work done fast . . . and cheaply . . . with
BROWNHOIST CRANE

Working with magnet, hook or bucket, this Brownhoist 30-ton Diesel Electric locomotive crane equipped with electric swing (shown here in the Atlantic Steel Co. yards) is typical of the hundreds of Brownhoist cranes that are doing—and have been doing—a tremendous amount of work rapidly and with economy throughout American Industry for the past 75 years.



BROWNHOIST

197

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...any size and shape you want in Types 405, 410 and 430 stainless plate

Carlson's stock of Types 405, 410 and 430 chromium stainless plate is the largest ever. You can order plates, large or small, and get delivery in a few days. Types 405 and 410 find wide application in petroleum processing. Type 430 is generally used for furnace parts, annealing boxes and nitric acid storage tanks. Consider the 400 series if you need stainless plates right now.

Prompt delivery isn't your only advantage. These grades cost less than chromium-nickel stainless steels and if you need irregular shapes and sizes, experienced men with specially designed equipment can cut your plates and get them out in a hurry. Carlson provides a complete service with a flexible operation to take care of your specific requirements. This combination of stock, specialization and service saves you time and money, *gives you what you want when you want it!*

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PLATES • PLATE PRODUCTS • FORGINGS • BARS • SHEETS (No. 1 Finish)

Where "HIGH PHYSICALS" are a "must"

...specify **B&L** *Strain*-TEMPERED BAR STEELS

Here is an exacting application where the use of Bliss & Laughlin's Strain-Tempered Steel simplified a machining problem and eliminated service failure.

The yoke posts in this pin press are subjected to heavy stresses when the screw exerts full pressure, thus requiring a tough, high-tensile steel.

Formerly made from heat-treated C-1035 and C-1040, these posts gave considerable trouble during fabrication because of distortion and poor machinability.

The substitution of C-1144 Strain-Tempered Steel has provided the high strength needed with an accompanying increase in machinability and freedom from warpage . . . saving costly heat treating and giving greatly improved service life.

Screw Yoke Post for removing king pin from universal joint. Bar members made of B&L Strain-Tempered Cold Drawn Steel.

Write for your copy of our new Bulletin No. 55 on Strain-Tempered Bar Steels.

Let B.&L. engineers show you how to get similar savings with the use of Strain-Tempered Bar Steels.

Closely controlled furnace treatments insure uniform Strain-Tempered Steel Bars.

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- **Injects a finely divided oil fog into the air stream that powers air operated equipment, coating all lubrication points with a continuous film of clean, fresh oil.**

MICRO-FOG can be conveyed to many outlets even at long distances, reducing equipment wear—cutting replacement and maintenance costs.

For complete information, call your nearby Norgren Representative listed in your telephone directory—or WRITE FACTORY FOR NO. 800 CATALOG.

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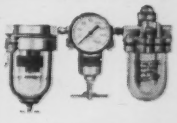

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Filter-Regulator-Lubricator

FOR AIR TOOLS, CHUCKS, CYLINDERS, MACHINE TOOLS

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a wide variety of combinations of Norgren equipment to meet your every air requirement.

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UNITCAST CORP.
"Lowest maintenance blast equipment in our shop . . . cleans deep core work as fast or faster than 2-wheel machine."
DAYTON MALLEABLE IRON CO.
"Over 530 hours on one set of blades . . . No abrasive gets out of machine . . . Door stays tight."
INDIANA FORGE & MACHINE CO.
"No direct labor . . . Trucker operates machine 68% reduction in abrasive costs; maintenance negligible."
WHEELABRATOR®
SUPER TUMBLAST
piles savings on savings - so users snowball, too!

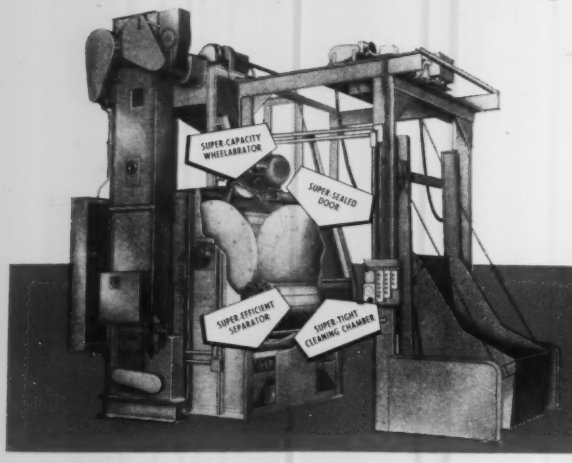
In less than a year, scores of plants of all sizes and in all types of industry have discovered the Wheelabrator Super Tumblast is the modern-day answer to high-priced cleaning costs. It's specifically designed for more mileage from blast equipment . . . more profit out of your cleaning room.

Savings in cleaning time result from the new high capacity Wheelabrator unit that throws more than twice as much abrasive as any similar-sized wheel used previously. Savings in abrasive use and parts wear result from action of the super-efficient abrasive separator that has 3 times the air separation area of conventional separators.

Savings in maintenance cost stem from reduced parts wear and are augmented by use of Long-Lyfe Parts throughout the machine.

Super-tight cleaning chamber and super-sealed door also minimize abrasive use, parts wear and maintenance expenditure.

In every area, Super Tumblast piles savings on savings to effect economies never before expected by airless blast cleaning users.



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Where products must be reliable . . . must stand up under vibration, temperature extremes and hard use . . . designers specify rugged, reliable, precision-built FLEXLOC self-locking nuts.

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FLEXLOC locknuts are strong: tensile strengths far exceed accepted standards. They are uniform: carefully manufactured to assure accurate, lasting locking action. And they are reusable: repeated removal and replacement, frequent adjustments, even rough screw threads will not affect their locking life.

Standard FLEXLOC self-locking locknuts are available in a wide range of standard sizes, types and materials to meet the most critical locknut requirements. Your local industrial distributor stocks them. Write us for complete catalog and technical data. Flexloc Locknut Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

STANDARD PRESSED STEEL CO.

FLEXLOC® LOCKNUT DIVISION

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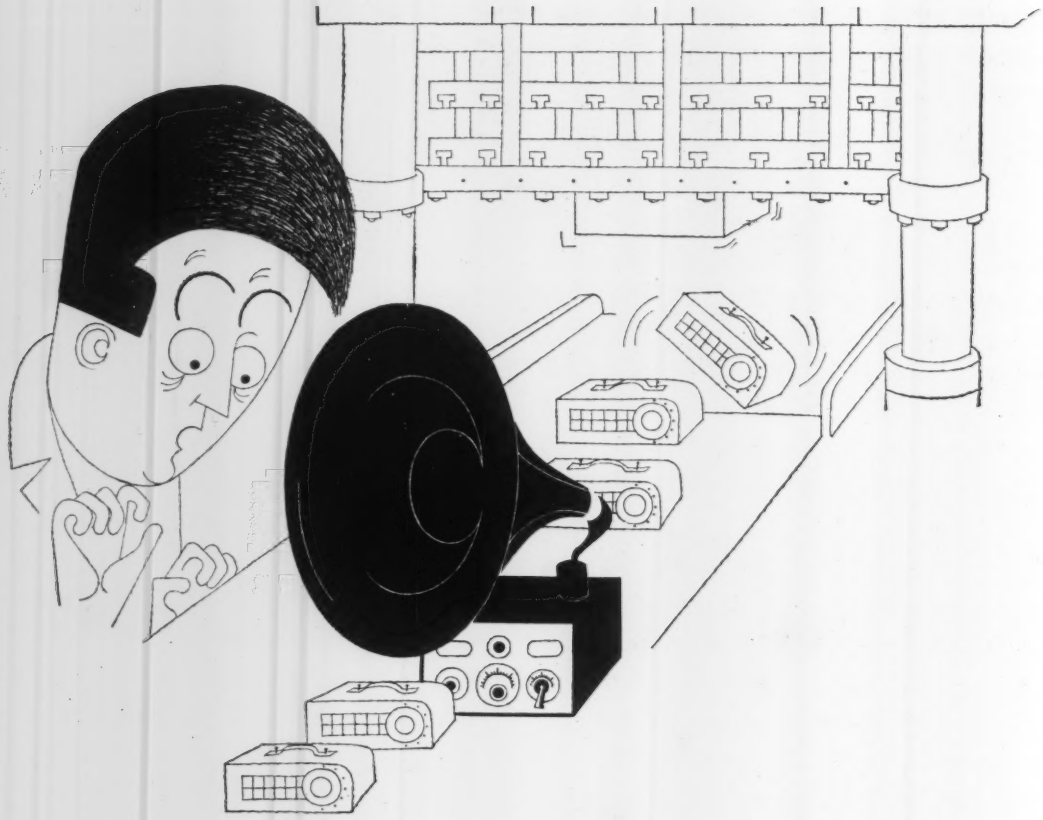

Got a plastic molding problem?

Solve it with **Crucible CSM 2 Tool Steel.** It's manufactured to mold and die steel quality. And it's promptly available from local Crucible warehouse stocks.

CSM 2 tool steel is electric melted to a high degree of uniformity in composition and structure. It has superior machining and polishing characteristics. And CSM 2 is pre-hardened—it eliminates time, cost and risks of heat treatment. Choose it for plastic molds, zinc die casting dies, and holder blocks.

Besides CSM 2 there are dozens of other special tool steels stocked at local Crucible warehouses.

And you can rely on Crucible for practical, helpful advice on selection and fabrication. For Crucible is the only specialty steel producer *fully integrated to the point of use*. That means control and responsibility from raw material to warehouse delivery to you.

STOCKS MAINTAINED OF:
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, Hy-Tuf, AISI Alloy... Onyx Spring, Hollow Drill Steel and other special purpose steels.

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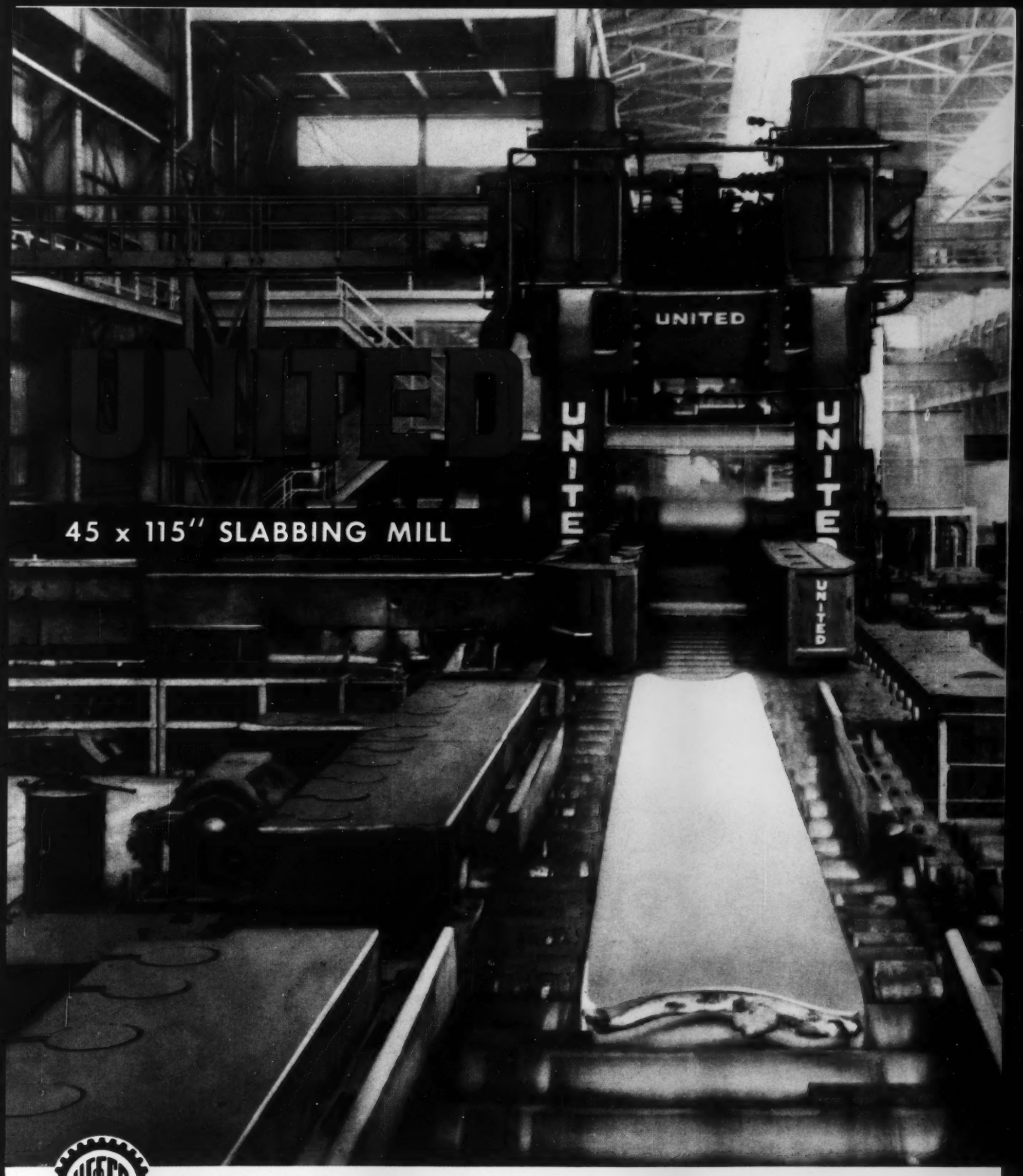
General Sales Offices, The Oliver Building, Mellon Square, Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Grand Rapids Harrison • Houston • Indianapolis • Los Angeles • Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Portland, Ore. Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.



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Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington.

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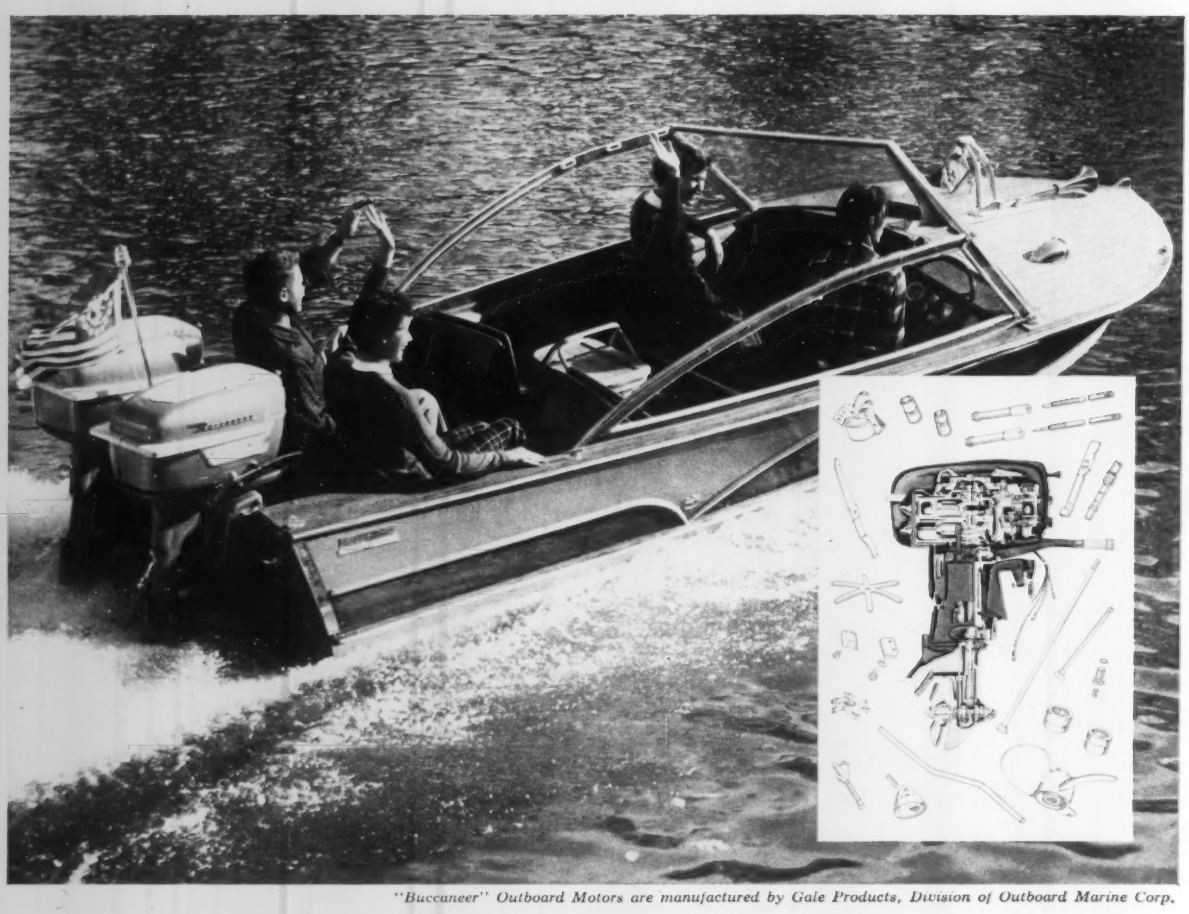

"Buccaneer" Outboard Motors are manufactured by Gale Products, Division of Outboard Marine Corp.

Add COPPER

...and the "put-put" purrs!

The portable marine power-plant has been growing up!

If you still remember the hard-to-start, quick-to-die engine of an earlier era . . . well, you'd hardly recognize today's sleek, streamlined models as outboard motors.

Copper alloys have helped make outboards bigger, higher-powered . . . with more convenience features, more accessories, *and much more reliable performance on the water.*

Copper-alloy components account for motor cables, choke control rod, throttle control gear and shaft, drive shaft and gear bushing, shift and shift-lever assembly, speed needle valve, water pump impeller and high speed nozzle . . . and other long-wearing parts.

Does *your* product chug along with a "put-put-put" instead of speeding by with a thrilling "purr-r-r"? Is *your* market growing . . . and demanding new product-improvements?

Copper may be your answer. Copper for high electrical conductivity, for corrosion resistance, for efficient heat transfer, for miniaturizing. And Copper is easy to work with . . . to machine, form, draw, stamp, polish, plate, weld or braze. By reason of the higher-cash-value of your manufacturing scrap, your net cost for Copper is reduced.

Plan your improvements with Copper! For the Copper Industry will provide ample supplies for all the years that stretch ahead.

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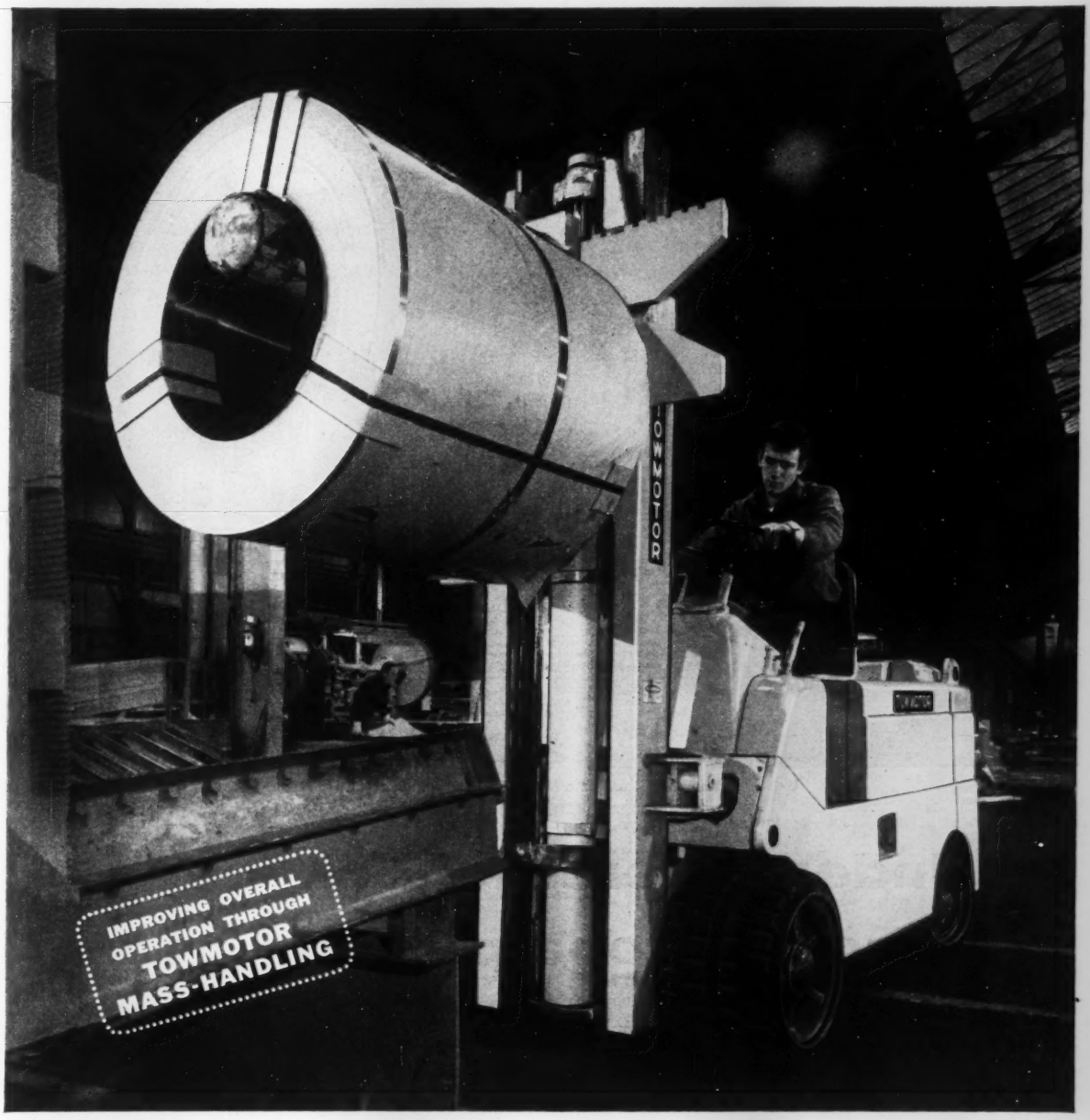


...here's "manpower" that hands you a bonus!

Think how many of your plant's handling jobs can be accomplished with much less effort—swiftly and profitably—by one operator "teamed up" with a powerful Towmotor fork lift truck!

You get an entirely new concept of modern mass-handling. You get a "bonus" in extra profits because you multiply manpower with the payroll you have. And you get a bonus in plant-wide morale when work flows on-schedule through every department . . . effortlessly . . . with a bigger day's work done.

Called the "ideal" fork lift truck by management and operators alike, the latest Towmotor models offer exclusive features as advanced as these, at no extra cost:

- New-concept functional engineering
- Simplified dual-entry compartment
- Full-traction weight distribution
- Adjustable off-center visibility
- New *motion-studied* centralized control
- Towmotor improved precision steering

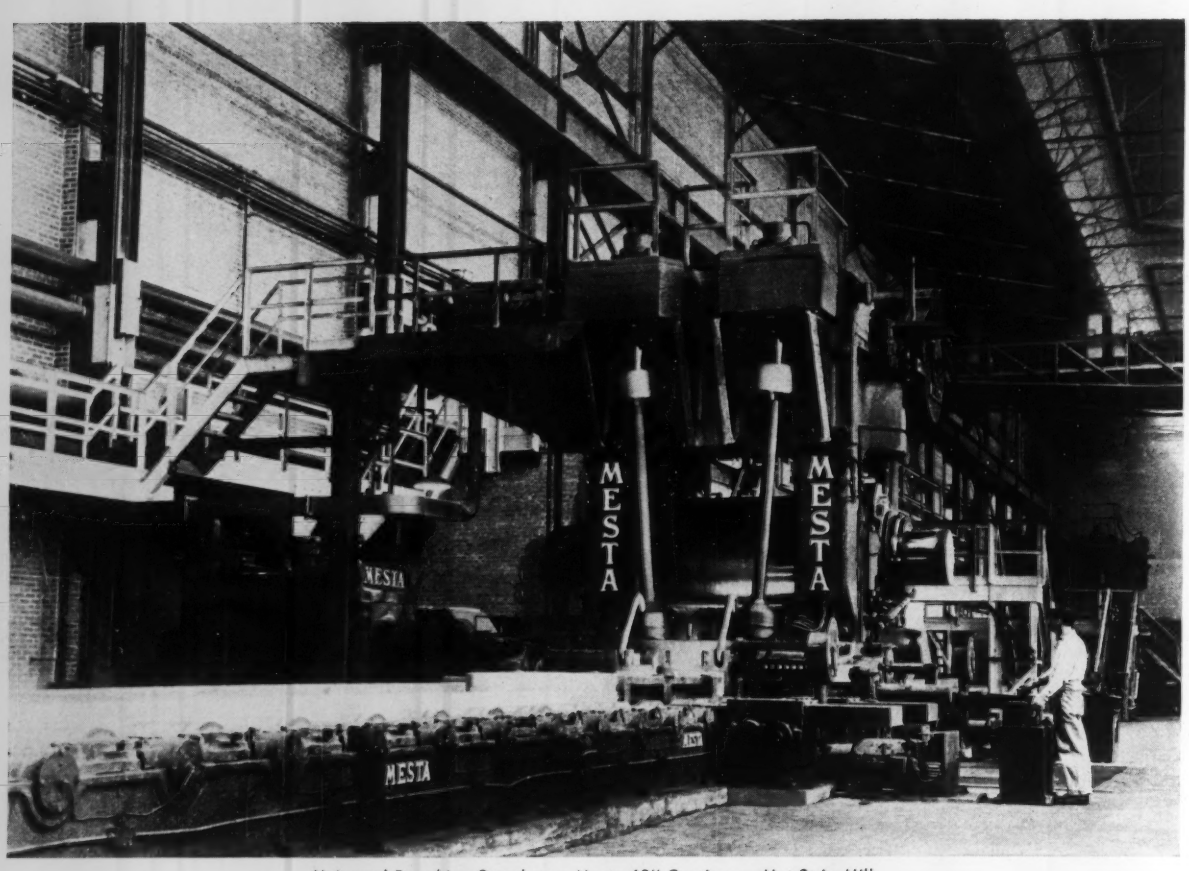
Power steering, 'TowmoTorque' Drive at extra cost

These and 60 other points of superiority are described in Towmotor booklet SP-23 for comparison. Get a copy from Towmotor Corporation, Cleveland 10, Ohio.

Leaders for 38 years in building Fork Lift Trucks and Tractors

TOWMOTOR -GERLINGER
THE ONE-MAN-GANG

Gerlinger Carrier Co., Dallas, Oregon, is a subsidiary of Towmotor Corporation, Cleveland, Ohio



Universal Roughing Stand on a Mesta 68" Continuous Hot Strip Mill

Under severest shock loads Texaco Meropa protects gears

Even under shock loads that may go over three million pounds, *Texaco Meropa Lubricant* protects reduction gears. This is because of special polar additives that provide the protective boundary lubrication needed at these critical moments to prevent scoring, ridging and scuffing of metal.

In addition, *Texaco Meropa Lubricant* embodies extreme pressure properties to assure smooth operation, with less wear, under sustained high pressures.

Texaco Meropa Lubricant resists oxidation and thickening . . . will not foam . . . will not separate in service or storage. It's the practical way to protect equipment and reduce maintenance costs.

There is a full line of Texaco Lubricants for all steel mill requirements. Let an experienced Texaco Lubrication Engineer suggest the right ones for you. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

Aircraft Employment To Drop

Look for personnel cutbacks in the aircraft industry of up to 12 per cent. Reason: The shift to missiles and Defense department budget cuts. Total employment is now some 890,000—some 590,000 are production workers, which surpasses the number (568,700) on the payrolls at the height of the Korean War. Average hours worked by aircraft employees have continued to fall since the first of this year. In March, they had dipped to an average 42.1 per week.

Financial Problems in Electronics

More electronic manufacturers and distributors are in financial trouble, says the National Credit Office Inc., New York. In the 12 months ended Apr. 30, the number of electronic firms that had to reorganize represented a 175 per cent increase over 1952 figures. The rate for all business from 1952 to 1956 showed a 66 per cent increase. The liabilities involved show a startling gain, too. Electronic manufacturers that failed last year had liabilities totaling $19.5 million, compared with $11 million for the preceding year. Nor are the electronic companies that fail all new. The average age in the 12 months ended Apr. 30 was 13 years.

More Industrial Air Conditioning?

Industrial air conditioning can result in increased profits through reduced accidents, improved employee relations and increased efficiency, says the Small Business Administration. A survey of 75 plants in the metropolitan New York area showed that the average plant without air conditioning lost the equivalent of $108 in wages for each employee during the year. The survey also showed that about 100 days in each year are so hot or humid that workers in non-air-conditioned plants slowed down.

Uptrend for Coal

Bituminous coal production in 1957 will exceed last year's output despite slower industrial production, the National Coal Association reports. Output in calendar 1957 is estimated at 506 million tons. For the 12 months ending June 30, 1958, the estimate is 510 million tons (1956 production was 500 million tons).

New Leases on Ore

Columbia-Geneva Steel Division of U.S. Steel Corp. picked up its option to lease the "Atlantic City" iron ore project in Wyoming on July 1. No decision has been made on development of the low-grade ore, but testing has shown favorable results. Pickands Mather & Co., Cleveland, leased Wabush Lake iron ore deposits after enabling legislation by the Newfoundland government. Youngstown Sheet & Tube Co., Interlake Iron Corp., Cleveland, and Steel Co. of Canada Ltd., Hamilton, Ont., joined with

Metalworking Outlook

Pickands Mather in the ownership of Wabush Iron Co. Ltd., which will develop the mine.

Revolution in Home Building?

The center of action in home building may have to be shifted to companies large enough to effect drastic changes when they are needed. That was one of the major conclusions to come out of a conference of 20 authorities on home building, sponsored by Aluminum Co. of America. Homebuilders—both individuals and prefabricators—now are so numerous that none controls more than 1 or 2 per cent of total production. Three routes are open to bring changes: 1. Greater use of unit components. 2. A greater move toward complete prefabrication. 3. Increased use of mobile homes. Because of the smallness of residential builders, no one can set a trend today in any of those three areas.

Whrrrr in Power Mowers

The hot spells and heavy rains thus far this summer are sprouting grass —and power lawn mower sales. Last year, some 3.2 million units were sold for $250 million, retail. Unit volume should at least equal that in 1957, and dollar levels should be higher. Probably 200 companies make power lawn mowers, but less than 80 account for 80 per cent of the sales. The replacement market is improving—about half of all sales in 1957 will be of that variety, compared with one-third last year.

Tip to Exporters

That popular trademark can be poison in an overseas market. Slogans and catchy phrases in translation may be offensive to foreign ears. Some color combinations are taboo—green in Islamic lands (it's a holy color) and white in the Far East (there it symbolizes death and decay). You had better get local advice on advertising, product color, trademark and shipping label wording before tackling a foreign market.

Industrial Injuries Drop

The manufacturing's injury rate is holding this year at about 11 per million man-hours worked. The average for the first quarter and the rates for February and March were the lowest ever recorded for those periods.

Straws in the Wind

More than 10 million people now receive social security benefits . . . Metallurgical engineering majors graduating from Lehigh University will start work at salaries averaging $460 a month . . . The biggest single machining job ever attempted by Ford Motor Co. will be undertaken next month when the grinding and polishing tables in the Rouge glass plant are resurfaced . . . The ore potential resulting from 291 mineral exploration projects certified by the Defense Minerals Exploration Administration is estimated to be worth $490 million, based on December, 1956, prices.

HERE COMES THE ARMY TO TACKLE THAT LITTLE ROOF PATCH JOB.
WITH ALL THEM BRICKLAYERS THEY'LL ONLY HAVE TO LAY ONE BRICK APIECE
BEFORE THEM GUYS GET AT IT --- THE OTHER END 'LL PROBABLY FALL IN!
THANKS TO THE OPEN HEARTH CREW BUCKEYE STEEL CASTINGS CO. COLUMBUS, OHIO
KUEKES

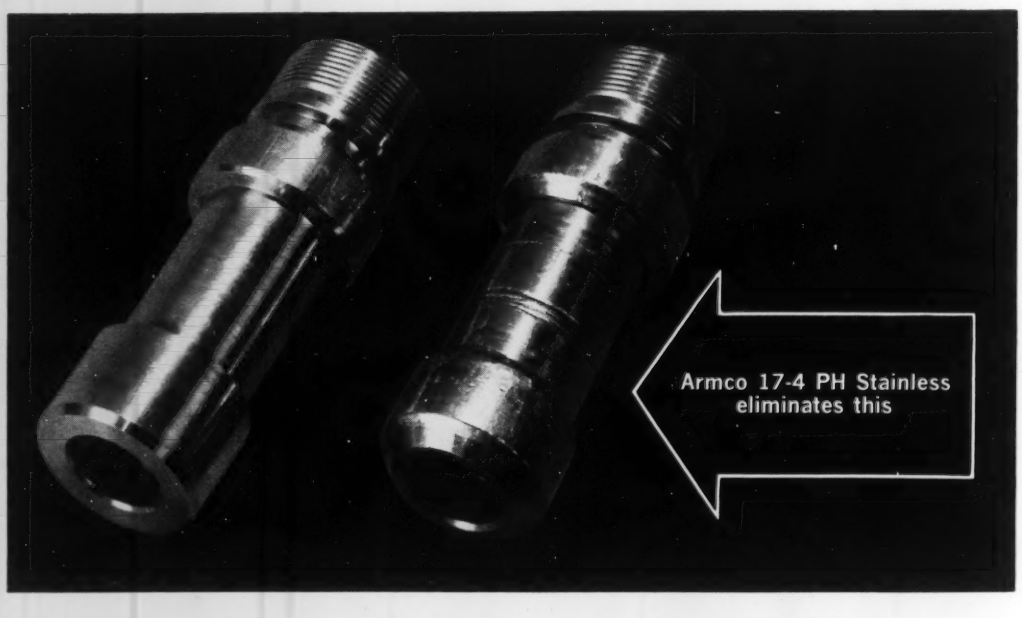
The Visiting Team

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15 OHIO

Designer Solves "Fishing" Problem with Armco 17-4PH Stainless Steel



Unusual combination properties of special Armco Stainless assures satisfactory performance of vital part.

This problem was not landing a "big one" but designing a valve "fishing neck" to give unfailing performance in rugged underground oil well service. Formerly made of a high alloy nonferrous metal, the part couldn't withstand the battering and high stresses when grappling tools "fished" the valve to the surface.

Now made of Armco 17-4 PH Stainless, the part has the required corrosion resistance, high hardness and strength to assure good "fishing." And it eliminates costly delays in well operation.

Solution to Many Design Problems

This vital part is typical of how Armco 17-4 PH is being specified to improve product durability and performance in a wide variety of applications. Wherever parts are subject to corrosion in combination with high stresses, wear, abrasion or temperatures as high as 900 F, this special stainless steel gives you unusual opportunities to improve your products.

Here's what 17-4 PH Stainless offers:

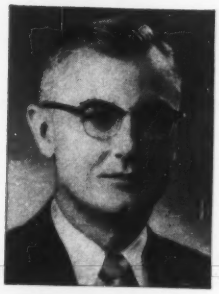
- **Typical ultimate tensile strengths up to 200,000 psi**
- **Rockwell hardness of C43 in the fully hardened condition**
- **High mechanical properties at temperatures up to 900 F**
- **No distortion and scale-free heat treatment at only 900 F**
- **Corrosion resistance generally comparable to Type 302**
- **Good machining and fabricating properties**

Armco 17-4 PH Stainless is produced in bars, wire and billets. A companion grade, Armco 17-7 PH, is available in those forms as well as sheets, strip and plate. For full information on the properties of these special Armco Stainless Steels, write us at the address below.

ARMCO STEEL CORPORATION

1357 CURTIS STREET, MIDDLETOWN, OHIO

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION



One Year Late

The stage is being set in Washington for a full-dress investigation of industrial pricing policies. Cast in the role of whipping boy is the basic steel industry, which has just put into effect a $6 a ton price increase. It partially offsets higher employment costs resulting from provisions for automatic wage and fringe increases in the industry's three-year contract with the United Steelworkers.

With practically everyone concerned over inflation, public interest in a normally dry subject will be heightened. The investigation show may have a good run. Maybe its producers can get parts of it on television.

Few will deny that the wage-price increase in basic steel is inflationary. It is an economic fact of life and a fairly obvious one which was not discovered in Washington. Industrial leaders, and particularly steel executives, have been pointing out that whenever employment costs outrun gains in productivity, price increases and inflation will result. There is no mystery about it. There is no magic to avoid it.

United States Steel's employment costs per employee hour have grown more than 8 per cent a year since 1940. Productivity gains have averaged less than 3 per cent per employee hour. Output per employee hour has moved up 50 per cent in the last 17 years, while employment costs per employee hour have ballooned 250 per cent.

In an industry like steel, where direct wage costs account for nearly half the total costs, large wage hikes will be followed by upward price adjustments.

What happened July 1 could have been foretold, and, in fact, was, when last year's wage contract was signed. If Congress wanted to investigate inflation and prices, that would have been a dandy time to start. We think the investigators are one year late now.

While steel producers will be soundly flayed during the Washington show, we doubt that they will be too badly bruised. They have been through such investigations before. They have a lot of economics on their side. Their price adjustments are in effect, and there they will stay, regardless of what happens during the hearings.

We are more concerned about the metalworking companies which use steel as their primary raw material. Not only are their material costs up, but they face increased employment costs of about the same magnitude as those of the basic producers. They are caught in a cost-profit squeeze that is beginning to hurt. Few have adjusted their prices to recover their increased costs. We hope the pricing investigation will not prevent them from making appropriate adjustments to protect their profit position.

Walter J. Campbell

EDITOR

What's New

IN STOCKS AND SERVICES FROM RYERSON

Recent developments of interest to men concerned with cost-cutting opportunities, sources of supply and availability of steel, aluminum, plastics and metal-working machinery.

STRUCTURALS—Greatly improved structural stocks after many months of short supply is the biggest news at Ryerson plants. Even many of the heavier sections for which demand is strongest are now available for immediate shipment.

PLATES—Stocks of heavy carbon steel plates are now much improved—and light plates continue in excellent supply. Moreover, these plates are produced to a new specification with more closely controlled chemical analysis resulting in better forming, welding and machining qualities.

HOT ROLLED CARBON STEEL BARS, including bar-size (light-structural) shapes—Huge Ryerson stocks of practically every size and shape now ensure immediate shipment of your company's requirements. Angles, channels and tees in bar sizes (below 3") are in equally good supply.

PRE-PAINTED SHEETS AND STRIP—To save you costly finishing operations Ryerson can now furnish steel sheets or slit coils pre-finished with durable baked enamel. Steel can be finished one side or two, in any plain color or in your choice of several patterns—and users report that the painted finish stands up under cutting and forming operations without cracking or peeling. Unusually large sheet and coil stocks plus unequalled processing facilities round out Ryerson sheet and strip service.

NEW ALLOY PLATE STOCKS—Due in July, midwestern stocks of A8620 plate steel in 1/2" to 6" thicknesses. This case hardening steel, ideal for rings, discs, gears, etc., can be furnished in flats or flame-cut blanks. These stocks supplement eastern stocks of E8615 plates. Also coming this summer: Eastern stocks of 4140 alloy plate.

STAINLESS, CARBON STEEL TUBING AND COLD FINISHED BARS—All types and sizes available in the nation's largest stocks—including nickel-bearing stainless, supply of which was, until recently, affected by nickel shortage.

ALUMINUM FOR ARCHITECTURAL USE NEWLY AVAILABLE—Ryerson plants supplying aluminum can now furnish Type 5005 in sheets and coils. This type is especially suitable for architectural use because it closely matches the finish of architectural aluminum extrusions—and it takes clear or color anodizing very satisfactorily.

PVC PLASTIC PIPE IN LARGE DIAMETERS—8'' and 10'' pipe in both schedule 40 and 80 have been added to growing Ryerson stocks of the remarkably anti-corrosive plastic—Ryertex-Omicron polyvinyl chloride. Valves and fittings of PVC for these big sizes also available.

QUICK MACHINERY DELIVERIES FROM STOCK—Machinery demand continues strong but improved production facilities have resulted in quicker deliveries of many types of metal-fabricating machinery available from Ryerson. This is true of equipment produced by Kling, Dreis & Krump, Bertsch, Wysong & Miles and several others. Some of the more popular models are even available from stock.

RYERSON CERTIFIED QUALITY

JOSEPH T. RYERSON & SON, INC. PLANTS: NEW YORK • BOSTON • WALLINGFORD, CONN.
PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO
CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Price Increases on Selected Steel Products

(Increase per net ton)

Hot-rolled bars	$7.00
Cold-finished bars	$9.00
Standard structural shapes	$5.50
Plates	$5.00
Hot-rolled strip	$5.00
Cold-rolled strip	$6.00
Hot-rolled sheets	$5.00
Cold-rolled sheets	$6.00
Manufacturers wire (coarse, bright, low carbon)	$9.00

Steel Price Stability Seen

Increase later in extras, such as we had last year, is unlikely. Some of the boost in extras several months ago anticipated present rise in operating costs

WILL the latest rise in base prices of steel be followed by substantial increases in price extras?

Answer—Probably not.

This means that the new price level has a good chance of holding until next July when the steelworkers get another automatic wage increase under their three-year labor contract, which runs until June 30, 1959.

Why—Some of the substantial increase in price extras several months ago was in anticipation of the July 1, 1957, increase in operating costs.

Inflationary — Although steel prices are likely to hold steady for the next 12 months, the latest advance in them and steelworkers' wages will fan the fires of inflation. The steel industry is so basic in our economy that its wage and price moves exert a vast influence upon all other wages and prices.

Many metalworking companies, already caught in a cost-profit squeeze, will have no alternative but to pass on the added costs.

Producers of fabricated steel products are marking up prices, but not without misgivings. Wire and strip product makers, notably automotive suppliers, are concerned. They figure closely to get contracts.

Victims — Shops fabricating heavier steel products, such as structurals and plates, already have booked relatively long-term contracts that do not have escalator clauses, without fully charging for the higher cost of steel. Many have labor contracts which will follow the basic steel pattern.

Last summer, steel base prices went up an average of $8.50 a ton, an amount that the industry said was inadequate. That increase caused a 10-point rise in the finished steel price index of the U.S. Bureau of Labor Statistics. December saw the start of a rise in price extras that pushed the BLS index up another 6 points.

The latest increase in base prices (averaging $6 a ton) will raise the BLS index about 7 points.

Restraining Factors — Working against a hike in extras before next July are: 1. The profit squeeze being experienced by metal users. 2. Public reaction to the steel price increase.

The increase averaged $6 a ton,

just as STEEL predicted (see Mar. 25, p. 147 and June 24, p. 73). First to announce was U.S. Steel Corp., which is the pace setter in pricing because it is the largest producer.

U.S. Steel's increases, all in base prices, were effective at 12:01 a.m. on July 1.

While the increases averaged $6, they varied from $3 to $16 a ton on the more common forms.

Competition Recognized—Showing that competitive factors were considered, the price of nails was not raised as much as that of staples. Both items had borne the same price tag, which at most production points was 164 columns (equal to about $164 a ton). At these points, the price of nails was raised only 9 columns, while staples went up 11. Nails produced in the U.S. have had strong competition from lower-priced imports.

While steel prices went up, pig iron prices remained unchanged. (They rose $2 a ton last March.)

Added Cost—The latest increase in steel prices will add about $250 million to steel buyers' bills the rest of this year. (For the added cost of steel in several products, see the illustration on page 55.)

This is the sixth consecutive year of steel price hikes—each one being triggered by a wage increase to steelworkers.

Wages Vs. Prices—In announcing increases, Clifford F. Hood, U.S. Steel president, said they average about 4 per cent on carbon and alloy steel. Wage increase effective July 1 push U.S. Steel's employment costs up about 6 per cent to a record high, he pointed out.

While the July 1 rise in wages will vary from company to company, STEEL figures that the cost to a typical steelmaker is 17.1 cents an hour. The breakdown: 8.7 cents in employment costs resulting from the hourly increase of 7 cents; 1.7 on increments; 0.4 in holiday pay; 2.3 for Sunday premium; and 4.0 in cost of living.

Record Hourly Rate—"The new pay adjustments," Mr. Hood added, "bring the corporation's average hourly employment cost for wage employees in steel production to about $3.52 an hour, a record high."

Pay increases effective at the beginning of this month include:

1. A general increase of 7 cents an hour for hourly rated employees, plus 0.2 cent in the differential (6.3 cents an hour) between each of the steelworkers, 32 job classifications.

2. A cost-of-living increase of 4 cents an hour for hourly rated employees. (This brings to 7 cents an hour the total cost-of-living adjustments in the first year of the three-year labor contract.)

3. An increase to 1 1/5-times in the regular rate of pay for non-overtime work on Sunday. It was 1 1/10-times.

4. An increase to double time and 1/10th, from double time, for work on any of seven specified holidays.

In addition to those hikes, other increases resulted from similar and simultaneous adjustments in pay of salaried employees.

The increases in wages and salaries, Mr. Hood pointed out, also will cost the steel industry more for pensions and social security taxes.

Reluctant Followers—Other steel producers followed the price advancement pattern set by U.S. Steel, but some were saying the increase was insufficient to cover additional costs.

U.S. Steel's New Prices

They were raised, effective July 1, and they set the pattern for the steel industry. Increases range from $3 to $16 a ton, with the average being $6

(All figures cents per pound unless otherwise noted)

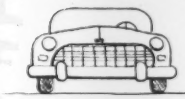
Carbon Steel	New Base Price	Increase
Blooms, billets, slabs—forging quality	$96.00*	$4.50*
Blooms, billets, slabs—rerolling quality	$77.50*	$3.50*
Tube rounds	$117.50*	$6.00*
Skelp	4.875	0.25
Bars and small shapes—merchant quality	5.425	0.35
(Fairless Works	5.575	0.35)
Bars and small shapes—special quality	5.775	0.35
(Fairless Works	5.925	0.35)
Cold-finished bars	7.30	0.45
Concrete reinforcing bars	5.425	0.35
(Fairless Works	5.575	0.35)
Structural shapes, including CB sections	5.275	0.275
Bearing piles, including CBP sections	5.275	0.275
Sheet piling	6.225	0.325
Plates	5.10	0.25
Floor plates	6.175	0.25
Standard tee rails—No. 1	5.525	0.25
Light rails	6.50	0.25
Tie plates	6.60	0.325
Joint bars for standard tee rails	6.975	0.375
Track spikes	9.75	0.525
Hot-rolled strip	4.925	0.25
Hot-rolled sheets, 18 ga. and heavier	4.925	0.25
(Fairless Works	4.975	0.25)
Cold-rolled sheets	6.05	0.30
(Fairless Works	6.10	0.30)
Vitrenamel sheets	6.625	0.30
Galvanized sheets, flat or formed	6.60	0.30
Long terne sheets	7.00	0.30
Electrical sheets—electrical grade, hot-rolled, cut lengths, 22 ga.	11.80	0.80
Electrical sheets—electrical grade, fully processed, cold reduced, coils and cut lengths	12.05	0.525

*Net Tons.

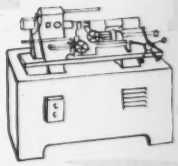
High Strength Steel	New Base Price	Increase
USS Cor-Ten:		
Structural shapes, including CB sections	7.75	0.40
Plates	7.625	0.375
Bars and small shapes	7.925	0.50
Hot-rolled sheets	7.275	0.375
(Fairless Works	7.325	0.375)
Galvanized sheets	9.725	0.45
Cold-rolled sheets	8.975	0.45
(Fairless Works	9.025	0.45)
Hot-rolled strip	7.325	0.375
USS Man-Ten R:		
Structural shapes, including CB sections	6.525	0.275
Plates	6.40	0.25
Bars and small shapes	6.675	0.55
Hot-rolled sheets	6.075	0.25
(Fairless Works	6.125	0.25)
Hot-rolled strip	6.075	0.25

What the Steel Price Increase Means to You:

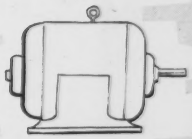
$23 more
IN SIX-ROOM HOUSE



$11 more
IN $3000 CAR



$24 more
IN TURRET LATHE



6¢ more
IN ¼ hp MOTOR

	New Base Price	Increase
USS Man-Ten S:		
Structural shapes, including CB sections	6.975	0.275
Plates	6.85	0.25
Bars and small shapes	7.125	0.55
Hot-rolled sheets	6.525	0.25
(Fairless Works	6.575	0.25)
Hot-rolled strip	6.525	0.25
USS Abrasion Resisting:		
Plates	6.75	0.50
Bars and small shapes	7.175	0.70
Hot-rolled sheets	6.625	0.50
Hot-rolled strip	6.625	0.50

Alloy Steel

Ingots	$77.00*	$3.00*
Blooms, billets, slabs	$114.00*	$7.00*
Hot-rolled bars	6.475	0.35
(Fairless Works	6.625	0.35)
Bar and structural shapes	6.55	0.35
Plates	7.20	0.35
Hot-rolled strip and sheets	8.10	0.35
Cold-finished bars	8.775	0.45

Wire & Wire Products

Wire rods, carbon:		
Donora, Cleveland, Joliet and Fairfield	6.15	0.35
Worcester	6.45	0.35
Cold-rolled low carbon strip:		
Cleveland	7.15	0.30
Worcester	7.70	0.30
Wire—mfrs. coarse, bright low carbon:		
Cleveland, Donora, Joliet, Duluth, Rankin, Waukegan and Fairfield	7.65	0.45
Worcester	7.95	0.45
Premier spring wire—high carbon:		
Cleveland, Donora, Duluth and Waukegan	9.30	0.60
New Haven, Trenton and Worcester	9.60	0.60
MB spring wire—high carbon:		
Cleveland, Donora, Duluth and Waukegan	9.30	0.275
Trenton and Worcester	9.60	0.275
Nails, stock:		
Donora, Duluth, Joliet, Rankin and Fairfield	Col. 173	9
Worcester	Col. 179	9
Polished staples, stock:		
Donora, Duluth, Joliet, Rankin and Fairfield	Col. 175	11
Worcester	Col. 181	11
Wire—merchant quality, annealed:		
Cleveland, Donora, Duluth, Joliet, Rankin and Fairfield	8.65	0.45
Worcester	8.95	0.45
Wire—merchant quality, galvanized:		
Donora, Duluth, Joliet, Rankin and Fairfield	9.20	0.45
Worcester	9.50	0.45
Wire—barbed:		
Donora, Duluth, Joliet, Rankin and Fairfield	Col. 193	9
Woven fence:		
Donora, Duluth, Joliet, Rankin and Fairfield	Col. 187	11
Bale ties:		
Donora, Duluth, Joliet and Fairfield	Col. 212	16

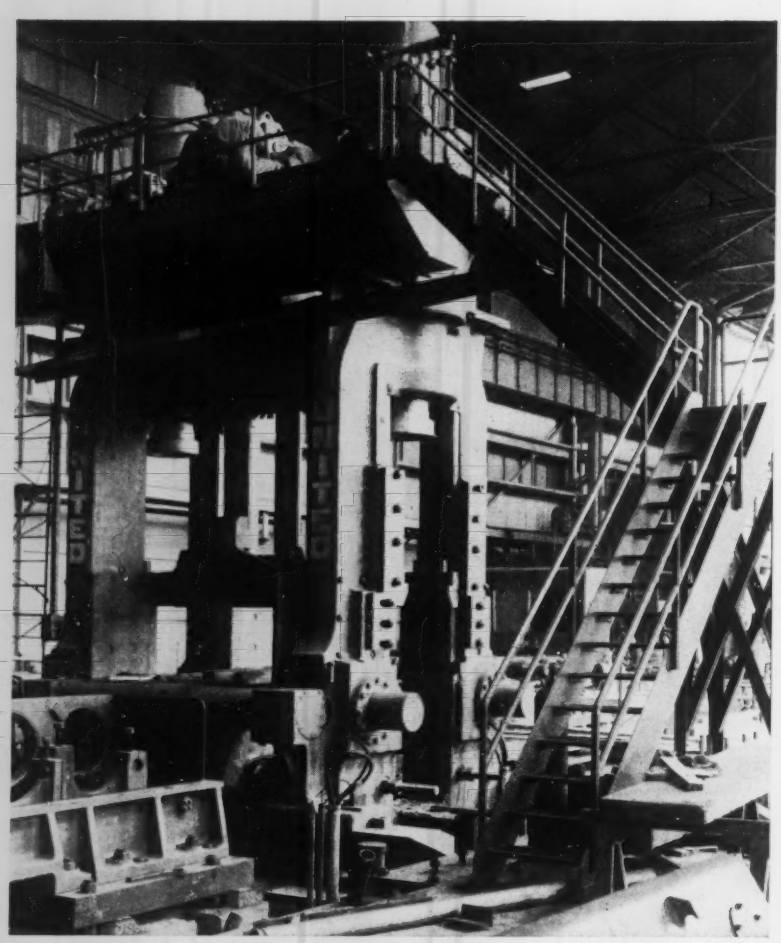
Pipe and Tubular Products

Buttweld pipe, standard and line, black and galvanized, ½ to 4 in.	$8 per ton (discounts reduced 4 points)
Seamless pipe, standard and line, black and galvanized, 2⅜ to 24 in. OD	$8 per ton (discounts reduced 4 points)
Electricweld line pipe, 24 in. OD	$8 per ton (discounts reduced 4 points)
Seamless and electricweld line pipe, 26 to 36 in. OD	$6.50 per ton (discounts reduced 3¼ points)
Oil country casing, grade J-55, short t and c, all sizes	$9.50 per ton, with proportionate increases in other grades and types
Oil country tubing, grade J-55, upset t and c, all sizes	$10.25 per ton, with proportionate increases in other grades and types
Drill pipe, grade D, internal upset, all sizes	$15.50 per ton, with proportionate increases in other grades and types
Seamless pressure and mechanical tubing:	
Carbon	about 5.5 per cent
Seamless pressure tubing:	
Alloy	about 4.5 per cent

Stainless Steel

Mill price bases and extras are increased about 4 per cent

*Net tons.



Order backlogs on machinery like this run year or more, so...

Steel Mill Builders Rushed

STEEL PRODUCTION may run hot and cold this summer, but there's no change in the climate for expansion. Mill equipment backlogs are as firm today as they were one year ago.

A STEEL survey of 15 major steel mill equipment producers draws this picture of the typical supplier: The dollar volume of his backlogs is as large as it was last year. Although new orders dipped in the second quarter, there's enough work on the books to keep the company operating at capacity throughout the year.

Going Up — Two equipment makers told STEEL that their backlogs rose more than 10 per cent in the past year. One was Yoder Co., Cleveland, which reported firm demand for tube and pipe mills, roll forming equipment and slitting machinery. An eastern manufacturer of billet mills announces its backlog increased from 17 months in midyear, 1956, to 20 months now.

Three firms said backlogs have been going up gradually this year. Those of United Engineering & Foundry Co., Pittsburgh, came to $117.5 million in July, 1956, and $114.2 million at the end of that year. In the second quarter of this year, they had climbed to $118 million—enough to provide for capacity operations this year.

Backlog Bolstered — Blaw-Knox Co., Pittsburgh, reported a backlog for all products of $140 million in July, 1956. At the end of the year, unfilled orders amounted to $153 million, then rose to $155 million in early second quarter. Said a spokesman: "Backlogs are holding firm in foundry and mill machinery."

Five equipment producers have made no dent in hefty backlogs during the past year. Aetna-Standard Engineering Co., Pittsburgh, says unfilled orders totaled $35 million in 1956 and are holding at about that level. "Several foreign orders for tube mills help to maintain the backlog," says a sales official.

At Capacity—Mesta Machine Co., Pittsburgh, reports its uncompleted orders continue to average about $79 million, which was the level on Jan. 1 this year. Mesta expects capacity operations "beyond 1957."

Five producers told STEEL that they have whittled backlogs in the last six months. Steel supply has improved, aiding production, and most suppliers agree backlogs were abnormally heavy at the beginning of the year. "Our order book is full for the next 8 to 12 months, despite our best efforts to trim it. Slowdowns in the steel operating rate in recent weeks lowered demand from last year's frantic peaks to a more normal, strong level," says one supplier.

STEEL's survey shows the typical producer's new order rate declined less than 10 per cent in the second quarter. One equipment maker reported a gain. Five said sales volume was steady; six reported drops of as much as 10 per cent, and three had bigger setbacks.

Mills Wanted—Several producers report increasing interest in some mills, although sales of other products lag. Among equipment items in growing demand are billet, plate, tube and structural mills and nonferrous mills. Orders are also firm for strip mills that can roll light plates. European industry is a good and growing customer for equipment.

Increased demand for ore concentration and processing equip-

ment was reported by R. J. Wean Sr., president, Wean Engineering Co., Warren, O. Mr. Wean also said that many steel producers are studying ways and means to diversify their operations.

Moderate declines in demand are reported for bar mills, continuous galvanizing lines and cold-finished sheet equipment. One supplier says delivery time on galvanizing lines has been trimmed by one to two months in the past year. Another manufacturer says orders for charging equipment and cranes are down. Drives and control equipment sales also slipped.

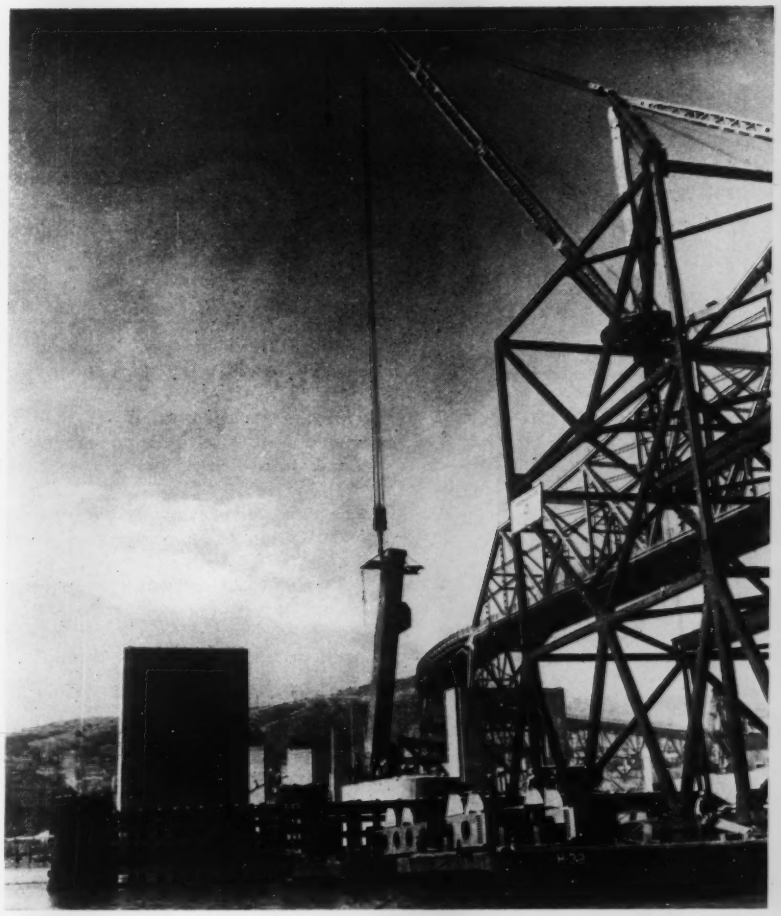
Short Term Halt — One firm sums up the current outlook: "With the operating rate likely to drop in early third quarter while labor costs rise, steelmakers may be caught in a temporary squeeze. They are holding up orders until their profit situation and their sales improve in September or October."

His comment suggests an early snapback from the sales decline of April and May. There's plenty of evidence to show the rise may be starting. "Roll bookings in June show a surprising upturn, after declines in April and May," says J. L. Campbell, vice president, Ohio Steel Foundry Co., Lima, O.

Outlook Brightening—"Demand for steel mill equipment improved in June. Many specialty steel producers will need new equipment to process special metals. Activity in rolling mill equipment should continue at a favorable pace through 1957," reports George Perrault Jr., vice president, E. W. Bliss Co., Canton, O.

"We look for equipment sales to pick up in September, barring the unlikely event that steel operations are below 70 per cent of capacity in that month and in October," says a spokesman for W. B. Pollack Co., Youngstown.

When steelmakers return to the market in large volume, they'll probably find they must pay more. "We will pass along any price increases in steel to the customer. Delivery is being made now at year-old prices. We are lagging behind in our price structure," says one manufacturer whose views are shared by many.



A 37-ton tower is hoisted into place as . . .

T-1 Goes Into Bridge

U.S. STEEL Corp.'s T-1 steel is being used in the construction of the four-lane Carquinez highway bridge near Crockett, Calif., between San Francisco and Sacramento.

It's the first time the new high strength material has been used in a bridge this size. More than 15,000 tons of it, considered by fabricators as "a new plate steel" will be used.

T-1, a low carbon product with small amounts of many alloying elements, has a guaranteed yield strength of 90,000 psi, triple that of carbon steel. It can be fabricated and welded and has a Brinell hardness of 321.

Advantages—Leonard C. Hollister, California Division of Highways project engineer, said tests showed that T-1 has greater stress resistance, economy and design advantages than other steels considered.

"The welded joints provided efficiencies of 87 to 100 per cent of ultimate strength of the parent metal and endurance ratios of 27 to 45 per cent of the ultimate strengths of the corresponding welded joints," said Mr. Hollister.

"It was necessary to give considerable attention to buttwelded joints of T-1 because rolling limits will not permit full length plates for member makeup," he said.

Seniority: Tailor It To Fit Your Needs

1. Keep "bumping" to a minimum.

2. Give "merit and performance" proper emphasis in defining seniority as it applies to such things as promotions and transfers.

3. Provide protection against having to lay off skilled people during temporary employment fluctuations.

4. Provide seniority rights for men promoted out of bargaining groups who might have to be brought back.

5. Be sure foremen maintain job assignment prerogatives.

6. Avoid mutual consent clauses in the provisions—give the union the role of being the "watchdog," with machinery to settle differences through grievance procedure.

7. Remember your moral obligation—older employees deserve consideration for long, faithful service.

The suggestions above can help your company in . . .

Reducing Seniority Costs

SENIORITY—one of those bargaining items generally referred to as a noneconomic union demand—is a real sleeper that sneaks into hidden contract costs.

Consider these costs in your plant which are affected by seniority provisions:

- Labor turnover: Estimates range from $125 per man in small firms to as much as $500 in some of the large ones.
- Employee training: Costs depend upon the job and the individual employee, but it's an expense that mounts during a layoff period when a contract permits excessive job bumping.
- Job bumping: In addition to the foregoing, costs involved while an individual gets accustomed to a new job include production loss and scrap increase. Side effects on morale and disruption within the department are also factors.
- Grievance costs: Seniority is involved in better than half of all grievances. Small and medium size firms estimate it costs them $10 to $25 to process a grievance; larger firms peg their costs at $60 to $80. Such settlements involve no more than two steps. Costs multiply as grievances approach arbitration.

"There's no formula for a best seniority contract," emphasizes Raymond Vacha, a negotiator for the Associated Industries of Cleveland who assists in about 300 contracts annually for member firms. "You must tailor your provisions to fit your own plant and employees. Important are the type of industry you're in, the products produced, the number and type of skills and operations required and the average age of the employees. If the work force contains men and women, you have special seniority problems."

There are six types of seniority: 1. Company. 2. Division. 3. Plant. 4. Department. 5. Group (such as machine operators or assembly groups). 6. Job (such as maintenance workers).

Plant Seniority—The first three types have few defenders in metalworking management, particularly in the medium and large companies. When seniority is too broad, management is handcuffed during a layoff period in trying to use manpower to best advantage. And it's generally true that during such a period cost cutting becomes increasingly important. Plant and company seniority have supporters, however. If you operate a small firm, have few skilled or semiskilled workers or perform a few easily learned operations, you can use plant seniority to advantage.

Lyon Inc., Detroit, has plant seniority provisions covering 800 to 1000 employees. Under the contract, an employee who is bumped from his job may bump any worker with less seniority anywhere in the plant if he can learn the job in five days. Says Robert Sasser, personnel director: "It has this advantage—it gives more people an opportunity to learn more jobs, which strengthens our labor force."

Group Seniority — Most union contracts contains seniority provisions which operate on the department, group, or job basis. Such types are the most complex. But most industrial relations executives agree that the complexities are worth the trouble if they keep job bumping to a minimum during layoffs, facilitate promotion of the best qualified employees and maintain management prerogatives in utilizing manpower efficiently.

Here are some suggestions:

1. Adopt a clause permitting

temporary layoffs without regard for seniority. (Ford Motor Co. can make layoffs of 12 days' duration without regard for seniority; the same provisions apply for 30 days during model change-overs.)

2. Avoid chain-type bumping within a group or classification. The best provision is for a displaced employee to bump only the worker with least seniority in the group. He can drop into the next lower classification, where he bumps the employee with least seniority.

3. Avoid provisions which allow a senior employee the prerogative of selecting his assignment within a group. The foreman must have this prerogative. He should see to it that there is a fair rotation of tough jobs, as well as those with the best incentive rates.

4. Avoid bumping across groups so far as possible. One note of caution: In setting up job classifications or sequences of jobs for seniority purposes, consider possible effects on skilled labor. When seniority groups are too narrow, it is possible that skilled men with many years' seniority might be laid off in one department while another department continued to operate with semiskilled workers of far less seniority. (Allis-Chalmers Mfg. Co. allows skilled workers the option of accepting a layoff or of being transferred to another classification in which they can be utilized; of course, they must have sufficient seniority to displace the men with least job tenure in that group. A provision of this type minimizes the possibility of losing skilled workers to another plant during a layoff.)

5. Provide seniority rights for men who are promoted out of the bargaining units. This applies primarily to foremen who might be demoted during a cutback in operations. Unless they maintain seniority in the units they leave, few men will seek promotion.

6. Specify that promotions be made on the basis of ability and physical fitness as well as seniority. Develop a method of measuring these qualities. You'll have little trouble with the union on the issue of physical fitness. But fur will fly when you justify the promotion of a man who lacks seniority on the basis of his "ability."

To avoid complications, take these steps:

- Define in detail what you mean by ability — such as, qualified through ability, experience, skill, demonstrated work habits, attitude and performance.
- Fix a time limit in which the individual must demonstrate that he can do the job. Five days is commonly allowed.
- Have periodic evaluations of employee performance. Foremen can rate workers and inform them of their ratings. When a promotion occurs, it can be based upon a superior work record.
- Develop or obtain tests which will measure the individual's capacity to do the job. They can include tests worked out by government agencies, such as welding tests and examinations in blueprint reading.

GE Folds Welding Department

General Electric Co., Schenectady, N.Y., will discontinue production of welding units, electrodes and all similar types of equipment.

Harold E. Strang, vice president, said this action "will enable the company to devote full time to other and more profitable lines." GE will continue to service and supply dealers and users and provide parts for all equipment in use, he said.

No plans for disposing of the welding department equipment have been made, and the company will continue "business as usual as much as possible," he added.

"This is just a matter of circumstance," Mr. Strang said. "The company looked at the welding department with an eye to return on the investment and decided that other departments offer more future than welding."

Ventilates Lincoln Tunnel

One of the 24 giant fans which will completely change the air in the third tube of the Lincoln Tunnel every 1½-minutes. Sturtevant Division of Westinghouse Electric Corp. built it

Japan Needs Atom

Westinghouse official says it is "a natural" to demonstrate what nuclear power can do

JAPAN is "made to order" for nuclear electric power, says Charles H. Weaver, Westinghouse Electric Corp.'s vice president in charge of atomic power.

His reasons: 1. Japan has a scarcity of conventional fuels. 2. She has limited water power. 3. Her demands for industrial power are double prewar levels.

"The need for atomic power is a thing of the present," believes Mr. Weaver. "The atom must surely supply most of Japan's power by the end of this century."

Steps Being Taken—He revealed that Westinghouse is negotiating a licensing agreement with the Mitsubishi enterprises for electrical and steam equipment to generate power and propel ships.

"We look forward to working with Mitsubishi under a similar agreement covering nuclear reactors and their associated auxiliaries which have been or will be developed by Westinghouse," he said. "Such an agreement has been arrived at in principle and will soon be submitted to the Japanese government for approval."

Prospects Good—Mr. Weaver believes Japan's economic, political and social climate is "ideal for the rapid commercial development of atomic energy."

He said Japan's technicians are competent to house and install nuclear reactors and that her industry can produce some of the necessary components. She soon would be able to manufacture reactors and the required fuels, he added.

Defense's Wilson Under Heavy Fire . . .

A TWO-PRONGED attack on Defense Secretary Charles Wilson may hasten his decision to leave government service sometime this year. Pentagonians are betting that he will leave this month or next. His aim had been to see Defense's fiscal 1958 budget through Congress, then lay the groundwork for fiscal 1959's. The second goal is far from complete, but charges of mismanagement in two vital defense areas (missiles and small atomic weapons) are becoming more than just "a pain in the neck," as he has described other attacks on him.

Army Col. John Nickerson's open defiance of propriety on the Jupiter-Thor controversy and ex-Atomic Energy Commissioner Thomas Murray's blast on our lack of small atomic arms represent continuing situations, not something that will blow over with time.

Mr. Murray will remain in the limelight as a consultant to the important Congressional Joint Committee on Atomic Energy; Colonel Nickerson will probably be back on the Jupiter project shortly.

Quarles Is Top Replacement Possibility

Although Deputy Defense Secretary Donald Quarles is regarded as an Air Force man, the chances are the Army and Navy will be able to do little to stop his appointment as Mr. Wilson's successor.

Mr. Quarles will deal more openly with missiles "and atomic arms" problems than Mr. Wilson, who has tried to show impartiality; Mr. Quarles will bring the AF point of view into sharp focus: Small atomic arms are much less important than missile warheads; the AF has this country's basic defense job and probably should run the missile program almost as it sees fit.

Navy Will Boost Missile Strength

One reason the Navy won't fight Mr. Quarles' appointment as much as it might have before: It has been given the go-ahead sign on increased expenditures for missiles and aircraft in the next several years. It comes on top of the AF's decision to hold such procurement at a steady $7 billion a year through fiscal 1960. As with the AF program (STEEL, July 1, p. 38), the Navy will tend to use less of its contractors' airframe capacity because the number of frames to be produced will drop. More of the Navy's aviation dollars will go into electronics.

The Navy's missile program doesn't directly conflict with the AF's so it will be allowed to have its share; the Army's does and will have rough going in the future—although public pressure will see to it that the Army is not without missiles altogether.

Chances that the Army's Jupiter and the AF's Thor may be combined into one missile seem better than ever before. Rumors that the Army has successfully fired its Redstone missile indicate that it is far enough along not to be put aside. About 85 per cent of the Army's missile dollars are in the Redstone. No money has been appropriated for the Jupiter in fiscal '58.

ODM Closes Four More Expansion Goals

Fast tax write-offs for nickel, steam turbines, strategic mica and steel castings are finished, says the Office of Defense Mobilization. Goals remain open for rollon-rolloff ships (industry seems little interested in the project); liquid oxygen and liquid nitrogen (it's almost filled anyhow); production facilities for direct Defense and AEC procurement; and research and development laboratories.

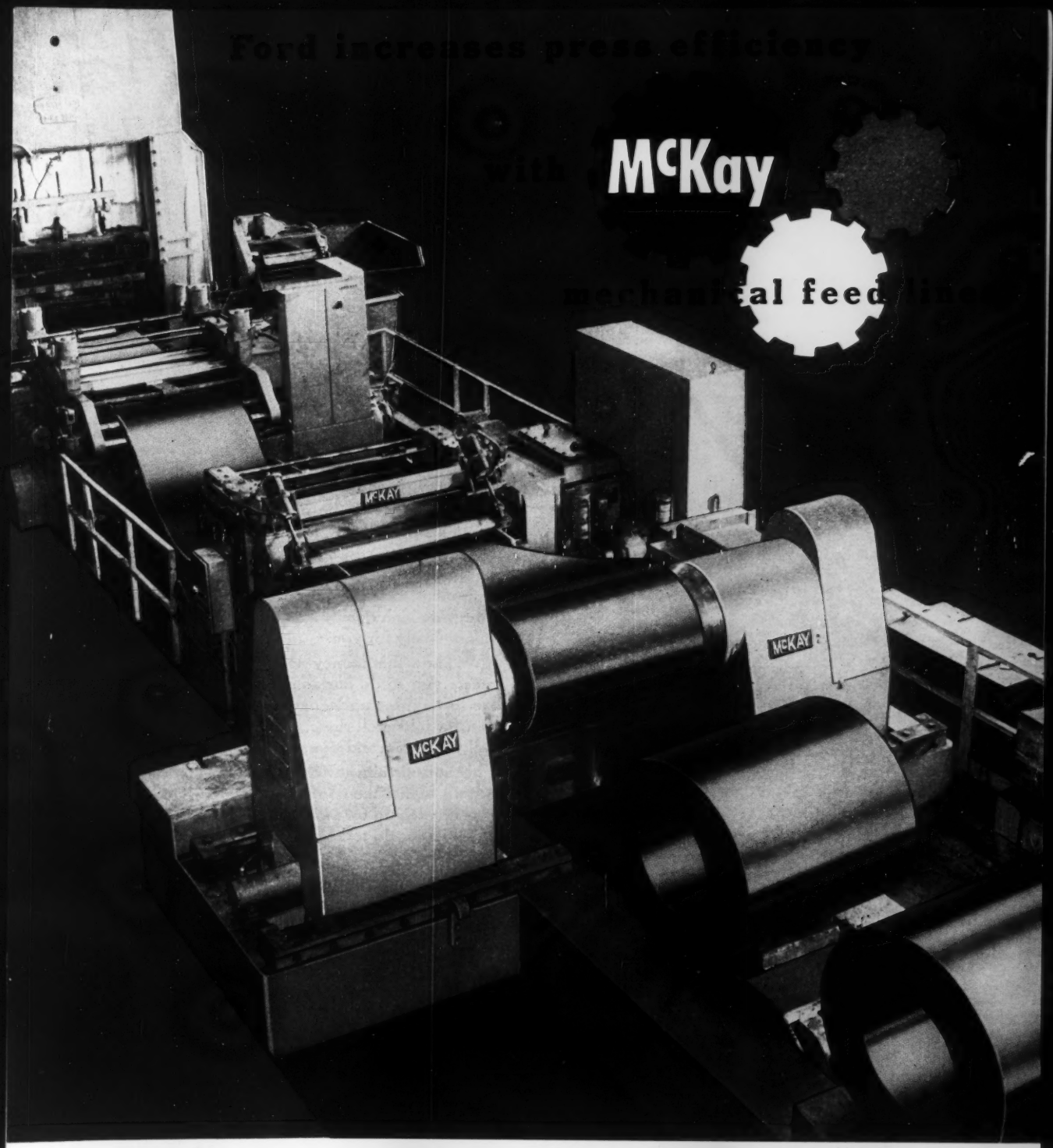
With a Defense ceiling on expenditures of $38 billion pretty well established for fiscal '58, it looks as if ODM has about finished its job, observe some insiders. They are ready to relegate it to a minor role.

Small Business Fires Blanks

Sen. George Smathers' (Dem., Fla.) Government Procurement Subcommittee of Sen. John Sparkman's (Dem., Ala.) Small Business Committee has succeeded in firing only some loud blanks in its current hearings on small business' part in Defense procurement. The committee's claim remains valid enough: Small firms are getting a declining share of Defense dollars.

The armed services have little by way of consolation to offer the senators; in fact, they are at the point of repeating themselves over and over. "Gentlemen," say Defense officials, "We're doing all we can to see that small firms get the business, short of a miracle." The facts: 1. It doesn't take too long for a good small firm to pull itself out of the small business class. 2. Few small firms have any engineers or scientists on their payrolls; so they don't get the research and development contracts and naturally don't get the production contracts. 3. Small business is doing all right on subcontracting.

"Why won't they settle for that?" ask Defense spokesmen. Look for more fireworks, especially with the AF cutback in aircraft, but don't expect much to happen: There are some mighty big firms which will be crying to Washington about declining Defense business this time next year.



To increase the output and efficiency of large presses the Ford Motor Company has installed a McKay Mechanical Press Feed Line that for the first time successfully cleans, levels, and feeds heavier materials for today's production requirements. Designed to process strip up to 60" in width and 1/8" in thickness, it works equally well on progressive die or blanking presses without overloading. And, because it is floor-mounted with independent drive it can easily be adapted to future production needs.

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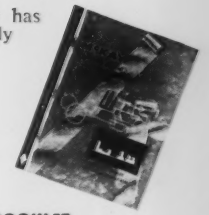

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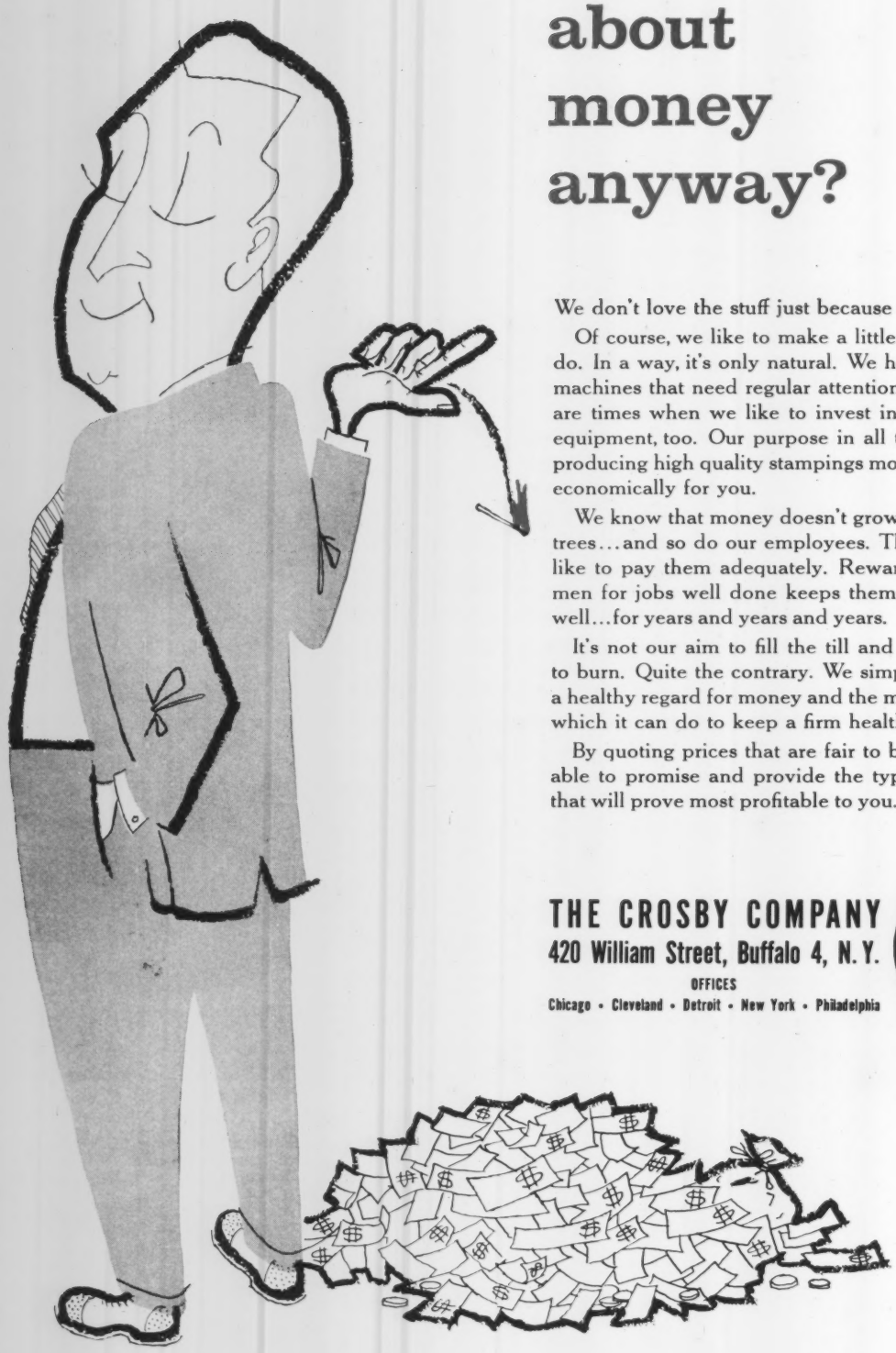

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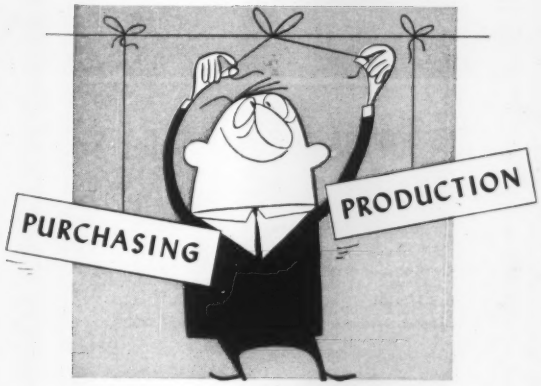


Cleveland Graphite ties two operations together with . . .

Purchase Analysis in Action

PURCHASE ANALYSIS is saving Cleveland Graphite Bronze Co. more than $100,000 a year. It also helps production scheduling and over-all operating efficiency.

Jack G. Mehring, director of purchasing and production planning for the sleeve bearing producer, has the job of co-ordinating raw materials, labor force and machine loading, inventories and production.

Like most component manufacturers, the Cleveland firm cannot control its market directly. Its output must be tailored to meet the varying demands of its customers. Careful analyses of its purchases must be made.

"Purchase analysis is as old as money," says Mr. Mehring. "Your wife uses it when she compares brands, taste, quality and price. Perhaps she thinks beans won't go with lamb. Maybe she buys peas instead."

How It Works—At this division of Clevite Corp., five buyers head up these divisions: 1. Raw materials. 2. Tools and equipment. 3. Operating and office supplies. 4. Repair and maintenance supplies. 5. Chemicals and packaging supplies.

Each buyer is credited with the savings he achieves. Each has his own performance standards and knows how the other divisions are doing. Each can call on the company's full time purchase analyst.

Quality, service and price are the standards applied in each purchasing decision. Many facets are involved: Perhaps the item should not be bought. If purchased: Will it affect manufacturing? Personnel? Sales? Weights attached to factors may change completely if freight or labor rates go up. An entirely new approach may be necessary in face of a new market or shift in customer demand.

Graphite's Savings—Last year, purchase analysis saved the company $113,000 on purchases of $18 million. In 1955, the first year of the formalized program, savings hit $122,000.

The negotiation of volume contracts accounted for 34 per cent of savings; development of new sources, 26 per cent; change of materials, 19 per cent.

Not a Yardstick—"While these percentages are interesting to us, we do not feel that they should be used as yardsticks by any other company," say Mr. Mehring. "You can't draw a guide line for the percentage of total purchases you can expect to save by a program. There are too many variables, not the least of which is the efficiency of your previous operation."

The company has four plants in Ohio—at Cleveland, Bridgeport, Caldwell and McConnelsville—and one at Ft. Wayne, Ind. Purchase analysis resulted in central contracts for some raw materials, with deliveries at branch plants against orders of branch purchasing agents.

Results: 1. Two handling operations eliminated. 2. Responsibility for controlling inventory put on the individual plants. 3. Communications with the home office purchasing staff kept at a minimum.

Other Gains — The Cleveland plant buys $30,000 worth of lamps a year at a volume discount of 36 per cent. Before the master contract, one plant obtained 34 per cent off list, another 31 per cent and the remainder paid net.

Cartons and packaging supplies were included in a central contract a short time ago. Estimated savings: $16,000 annually.

Cleveland Graphite's aim is to centralize all volume purchases. Records of maintenance, repair and operating items are placed on IBM equipment so that potential bulk buying savings can be easily spotted. Items due for centralization soon: Oils, solvent, detergents, soaps.

ODM Allows 14 Write-offs

Latest certificates of necessity for fast tax amortization issued by the Office of Defense Mobilization totaled 14. Nine were for defense or AEC procurement; five were issued under the steel castings goal. In the list were:

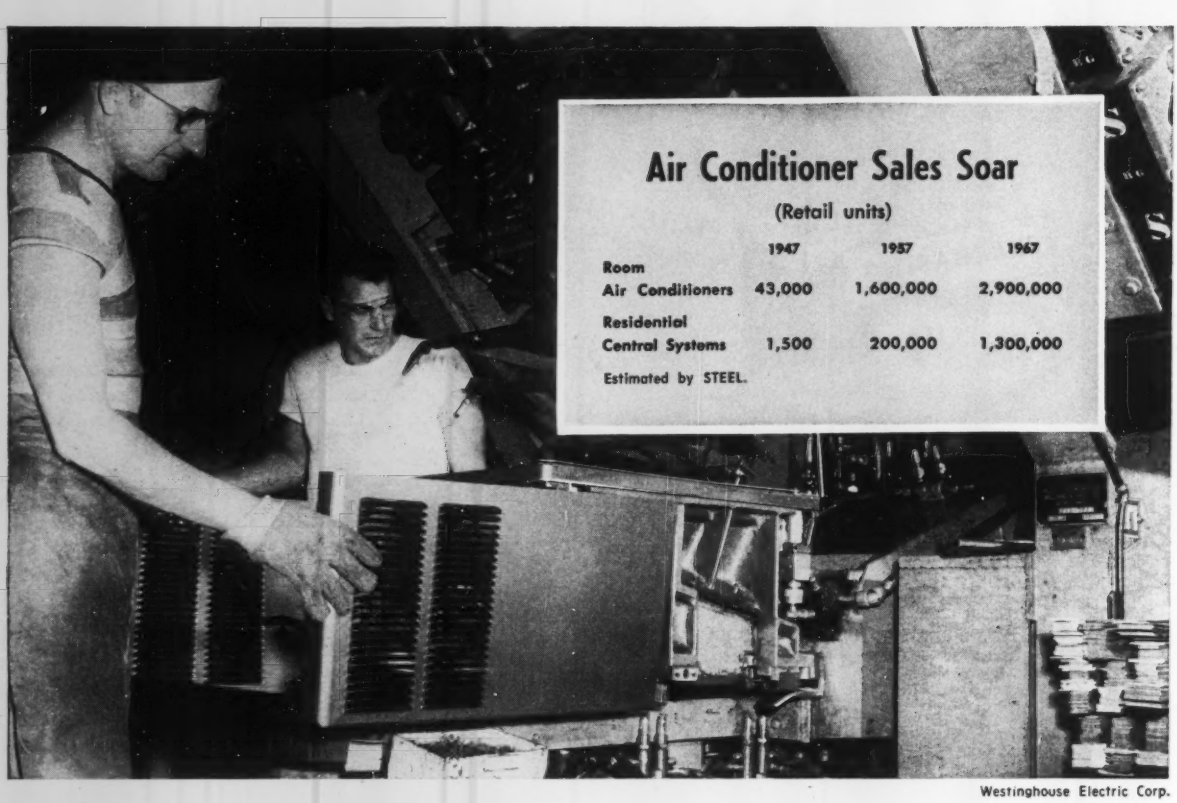
United Aircraft Corp., East Hartford, Conn., $4.7 million (75 per cent write-off) for military aircraft jet engines.

American Brake Shoe Co., Leroy, N. Y., $6.6 million (65 per cent write-off) for steel castings.

American Brake Shoe Co., Chicago Heights, Ill., $3.3 million (60 per cent write-off), steel castings.

Consolidated Foundries & Mfg. Co., Detroit, about $915,000 (65 per cent write-off), steel castings.

Denied was an application by United States Pipe & Foundry Co., Birmingham, for $8.3 million; also an application of Mustang Pipe Line Co. for $44.2 million for a crude oil pipeline.



Air Conditioner Sales Soar

(Retail units)

	1947	1957	1967
Room Air Conditioners	43,000	1,600,000	2,900,000
Residential Central Systems	1,500	200,000	1,300,000

Estimated by STEEL.

Westinghouse Electric Corp.

Hot Days Boost Cooler Sales

TO MOST of us, June's third week meant wrinkled suits and frayed tempers. To air conditioning men, it meant sudden prosperity.

After more than a month of cool, damp frustration, the men who make, distribute and sell air conditioners had something to shout about. Three days of 90-plus weather drove thousands of buyers into showrooms across the country, some so bent on relief they vowed they would install the coolers themselves. Consensus at this point: The industry's unit sales will reach totals forecast for 1957—1.6 million room air conditioners and 200,000 residential central systems.

New Construction — Although housing starts are down about 15 per cent this year, the prospect for record sales of central systems remains good. Cloud Wampler, Carrier Corp.'s chairman, predicts that 10 per cent of the new single family dwelling units will be completely air conditioned (the figure was 7 per cent last year). If he's right, we'll have 95,000 installations in this market alone.

With the introduction of less costly equipment for older houses, it's likely that an additional 95,000 central systems will go into existing residences. Conclusion: Sales will exceed last year's total of 170,000 units by about 20 per cent.

Sales Outlook—While manufacturers are generally optimistic in discussing sales performances to date, some radiate more confidence than others. Admiral Corp. says its sales of window units have "doubled." (This might be attributed to greater sales effort, since the company is marketing its own machines this year.) Carrier reports a 100 per cent increase in sales of room coolers, while admitting that last year's production was rather limited. Sales of central systems, long emphasized by Carrier, are up 30 per cent.

Fedders-Quigan Corp. contemplates a 50 per cent increase in unit sales, while Westinghouse Electric Corp. continues to shoot at a 35 per cent improvement in sales of room air conditioners, explaining that it has "carved out a goal that is slightly ahead of the industry's target." Central systems, says Westinghouse, should account for a volume comparable to last year's. At Frigidaire Division of General Motors Corp. the situation is reversed, with sales of window units at the 1956 level and central systems on the upswing.

Heat Wave Helps—From Richard Sierk, sales promotion manager for Whirlpool Corp., comes a report that "the week of concentrated hot weather really bailed us out. We're about 20 per cent

ahead on sales to our distributors." Emerson Electric Mfg. Co. calls recent re-orders "heart-warming," and York Corp. is "optimistic" about sales prospects. Says Austin Rising, York's vice president for marketing: "The recent hot weather has brought a nice improvement in the residential picture. The next 60 days should tell the story."

Although most manufacturers say that prices are in line with last year's, Fedders-Quigan Corp. calls them "higher and firmer." Westinghouse, taking an opposite tack, says prices of its central systems will be 6 per cent under 1956 levels. Higher costs are being offset by improved technology.

New Lines—Most significant development in window units seems to be the introduction of 7½-ampere machines which will operate on 115-volt circuits. Designed for the mass market, they require no special wiring. While most of these room coolers are ¾-hp models, Fedders-Quigan Corp. offers a 1-hp machine, claiming that it will deliver "35 per cent more cooling than other ¾-hp, 7½-ampere units." Westinghouse emphasizes "flexibility" in its central systems. They're available in 16 combinations, with cooling capacities of 18,000 to 70,000 Btu per hour. Coils and condensers are interchangeable, and this permits "custom tailoring" of the unit to a home.

One of the few companies to report the use of new materials is Carrier, which will replace sheet metal in some central systems with a rigid insulation board which has a vapor barrier on its exterior. Westinghouse is replacing the plastic front on one of its window models with expanded metal that has been painted to look like fabric.

New Ratings—Of particular importance to consumers has been an industry decision to standardize capacity ratings of room air conditioners. At the suggestion of the Air Conditioning & Refrigeration Institute, 23 major manufacturers agreed to test and rate their products in terms of Btu. With the elimination of such misleading terms as "tons" and "horsepower," it is possible for the buyer to determine exactly how much cooling capacity he is getting per dollar invested.

Investment Castings Gain

SALES of investment castings may hit $123 million this year. Though the figure is good, it is lower than earlier projections because of reduced production of jet engines, a prime use. A new upward trend is expected in 1958.

Sales—K. W. Thompson, president, K. W. Thompson Tool Co., New Hyde Park, N.Y., and president, Investment Castings Institute, reports sales in first five months this year are 6.5 per cent above the same period of 1956. He believes: "If we balance loss of business in jet engine blades against expected increases in other business, we'll have an approximate 7 per cent increase in 1957."

The industry got its start through World War II demand for turbine and jet blades and vanes. That field, plus guided missiles, is still the main user, possibly to the extent of 60 or 70 per cent of output. Another 15 to 20 per cent is accounted for by hardware components for jet missiles.

Makers—The U.S. has about 95 producers of investment castings. About 30 are prominent. About 20 operate nationally.

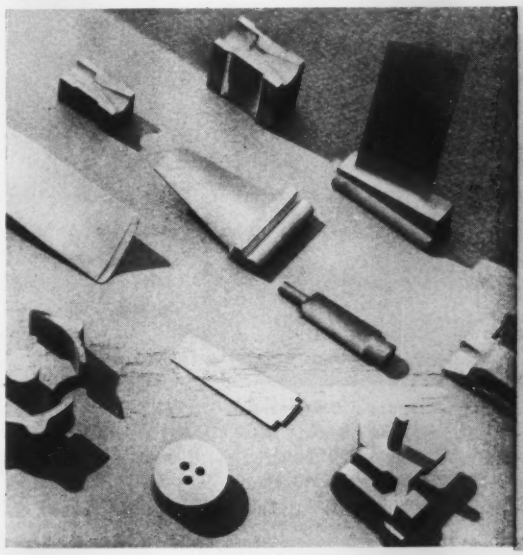
With jet production down, the industry will try to turn over some of its $170 million production capacity to commercial applications. One hot prospect is the automotive gas turbine, says T. Operhall, president, Misco Precision Casting Co., Whitehall, Mich.

Stepped up sales efforts have turned up over 75 new or expanded applications, especially in the high speed aircraft and missile fields where high temperatures and strength requirements are problems. Large parts—10 to 51 lb—made of tool steel and superalloys are needed in some new uses.

Prices—Prices are falling and will continue to do so, V. S. Lazzara, president, Casting Engineers Inc., Chicago, believes. William L. Worthen, president, Bone Engineering Corp., Glendale, Calif., points out that some prices are up slightly, but improvements in such things as tolerances, materials and surface finish give the buyer more for his dollar.

New Uses—Commercial uses include electronics, portable tools, food machinery, packaging, small arms, cameras and projectors, sewing machines, office equipment, cast-to-size tools, cams and gears.

Size—The castings weigh from a few ounces to several hundred pounds. You can make 300 pounders by the frozen mercury process, 60 pounders by the lost wax method. Roger Waindle, Wai-Met Alloys, Detroit, says a marriage between investment castings and forging has produced accurate forgings weighing up to 25 lb.



Investment Castings Advance

Estimated Sales	
1957	$123 million
1956	115 million
1955	102 million
1954	86 million
1953	80 million

Source: Investment Casting Institute.

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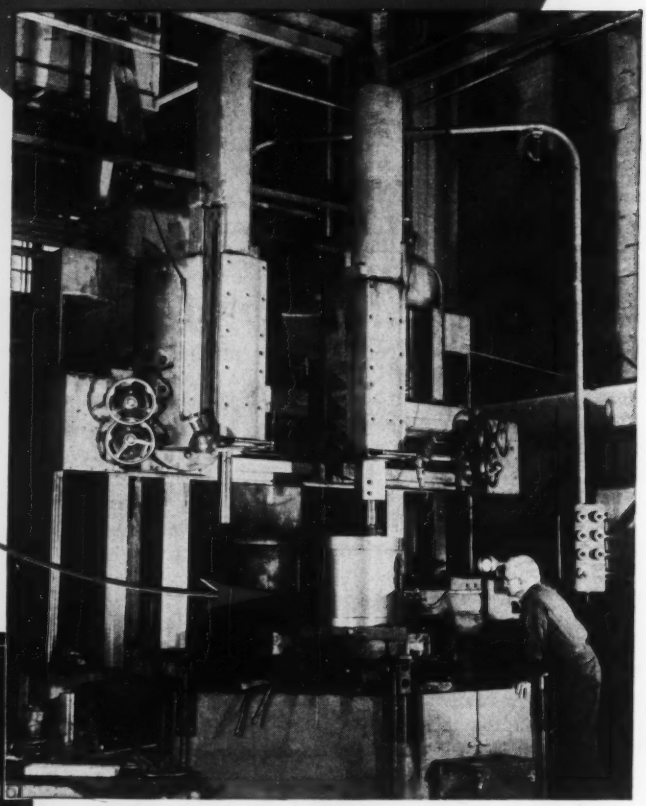
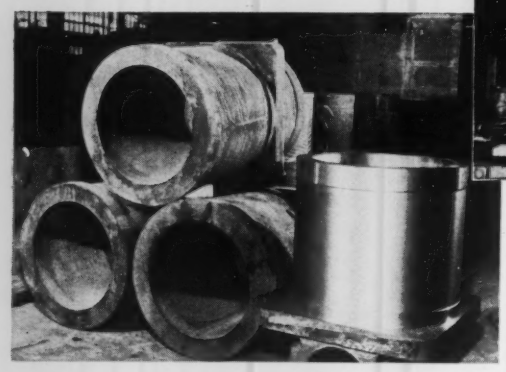
MODEL 75

In the machining of a barrel housing used in a large mechanical press, manufactured by the Clearing Machine Co., Chicago, Ill., Mr. L. W. Prochnow, Factory Manager says "our 66" Cut Master, Model 75 is a big, husky machine. Its heavier rams, overall rugged construction and greater horsepower provide higher speeds and feeds easily controlled from the movable Pendant. These features enable us to cut our floor to floor time, per piece, by four hours. And we've had no maintenance problems in nearly two years of operation." These same cost savings can be applied to your machining problems when considering replacement or additional capacity in your plant.



From rough casting, weighing 1,780 lbs., 28" in diameter and 36" long, to finished piece with a 35% saving in machining time.



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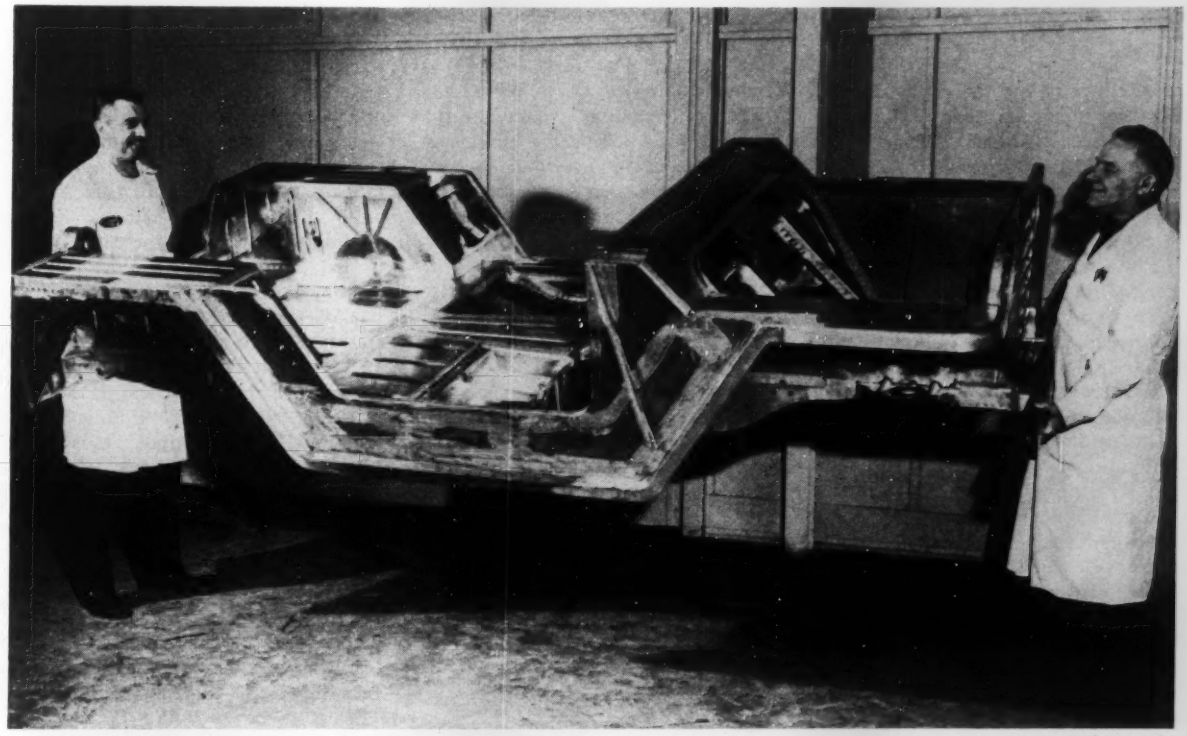

Ford Motor Co.

This aluminum unitized body is one-third lighter than its steel counterpart

Light Frames Far in Future

The all-aluminum car is a long way off. But the metal is gaining in parts; aluminum frames for autos probably will come in the late 1960s, and they'll be common on trucks in 1962

ALUMINUM FRAMES for passenger cars are at least five to ten years away. Aluminum truck frames should be common by 1962. That's the consensus of automotive engineers and aluminum companies.

It puts to rest the flock of pre-introduction rumors which hint that the all-aluminum car is just around the corner.

Steel Still Strong — Suppliers like Midland Steel Products Co., Cleveland, and A. O. Smith Corp., Milwaukee, indicate steel frames have plenty of miles to travel before retiring.

One A. O. Smith engineer points out that the three years or more needed to amortize present frame tooling is one of the best deterrents to drastic change he knows. Says a General Motors division: "There's little reason to switch to aluminum as long as we maintain present design trends in cars."

Support — Most GM lines will adopt the tubular X-frame designed for this year's Cadillac. By shortening or lengthening the center tube, the frame can be made to fit any number of wheelbases. GM will continue with this frame for at least three more years.

Not Now, But—Of course, the Big Three aren't overlooking the eventual use of aluminum frames. Their thinking seems to center on unitized or semiunit body construction.

Kaiser Aluminum and Ford Motor Co. recently developed a unitized aluminum jeep body which weighs 124 lb, compared with the 350 lb of its steel counterpart.

Kaiser engineers also report the company is working with an automotive division to develop an aluminum platform frame for passenger cars.

Carcass Construction—Leo Swoboda, Kaiser's chief auto development engineer, says such a frame probably would have a diecast firewall with flanged openings so frame rails could be bolted into position. Body and structural members would be fastened to this platform.

"Simpler construction methods mean finished unit costs should be equal to or lower than conventional frame costs," says Mr. Swoboda.

Saves Weight—But the biggest advantage will be lightness, which

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is important to the industry.

Ford and Mercury, for example, are concerned about front end weight. They want to cut it down regardless of cost.

Interim Step — This thinking paves the way for the replacement of minor parts in today's frames with aluminum members.

Ford and Chrysler, in particular, are looking at aluminum crossmembers, brackets and hangers. They may turn up on some lines within three years. But engineers agree that a present-day frame made completely of aluminum would be much too bulky to fit under modern car bodies.

Rigidity and fatigue limits steer designers away from the direct substitution of aluminum for steel in load-bearing parts of conventional frames.

Reynolds Metals Co., Louisville, hopes replacements will be the trend. Having long term, molten metal contracts with Ford and GM, Reynolds stands to benefit first from any switches to the lighter metal.

Its recent experiments with vacuum diecasting makes some Reynolds engineers think that unitized bodies made of diecast and extruded aluminum parts will be the long term answer.

Who's First? — Auto engineers point out that fastening these components may be a major holdup, but they do say the aluminum frame or aluminum unit body will come in time.

When it does, a low-volume line will be the obvious place to introduce it. Lincoln, which has unitized construction for '58, or Chevy's Corvette, which has been GM's proving ground for ideas, may get the nod.

Truck Outlook — Here is the quick approach. Louis McNitt, Midland Steel's frame engineer, is enthusiastic about the possibility of all-aluminum truck frames for heavy-duty vehicles. Their weight is vital.

He says: "We have aluminum frames for trucks now, but I believe you'll see them in common use within five years."

Import Race Starts

American manufacturers are jockeying for position in the import race which was started when GM announced it would put its British Vauxhall Victor and German Opel cars on the U.S. market this fall (STEEL, July 1, p. 48).

AMC Speaks—George Romney, American Motors Corp. president, followed through immediately: "The move is a positive confirmation of the soundness and success of our product approach with the compact Rambler and the small Metropolitan."

The Metropolitan is made for AMC in England. So far this year, AMC dealers in the U.S. have sold 5184, compared with 2794 a year ago.

Ford Replies — Spokesmen for Ford's International Division are quick to point out that they've been importing British Fords since 1949.

U.S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	498,000	430,373
6 Mo. Total†	3,370,617	3,192,601
July		448,876
August		402,575
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
June 1	82,431	77,433
June 8	129,517	104,984
June 15	125,372	100,689
June 22	118,805	105,148
June 29	124,923	103,034
July 6	75,000*	68,110

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

FIRST HALF PRODUCTION RACE

(Thousands of units)

Make	1957*	1956
Ford	817	701
Chevy	788	879
Plymouth	378	243
Buick	239	322
Olds	226	252

*Preliminary.
First five makes only.

Ford offers six models. The big sales push centers on the Anglia, which is comparable in size and price to Germany's Volkswagen.

The company asserts its biggest advantage over GM is 300 or 400 dealers which are already set up and part depots and service facilities which have been in operation several years. For the first four months of the year, British Ford sales in this country came to 3201, compared with 717 for the same period last year.

Chrysler Quiet—The only member of the Big Three that hasn't sounded off is Chrysler.

It doesn't have a car to import, although a deal with the Standard Motors Group, England, has been rumored for some time. Most observers feel the high cost of tooling and manufacturing a small car in this country will keep Chrysler from taking the step.

Foreign producers who have had things pretty much their way so far have been silent. They may be confused by the typically American sales splurge, or they may feel they'll get their share anyway.

A good bet: Volkswagen sales in this country this year will hit 90,000 or more. Next year the import race will get tough. As part of the campaign, GM is rumored to be facelifting its Opel.

As a countermove, Volkswagen may restyle its offering. Both cars have been rumored to have a change coming for over a year.

Exhaust Notes

- Edsel announces it will have a separate series of five station wagons in its 18 models. They will be called: Roundup, Villager and Bermuda in two and four-door six or nine-passenger models.
- Chrysler says it is making a tentative architectural plan for the 1700 acres it bought last year near Troy, Mich. The company says it won't build immediately. Most sources feel it's planning a central office building and research layout to compete with Ford and GM.
- Willys Motors Inc., Toledo, O., introduces its Forward Control Jeep FC 170 series. It is a larger version of the FC 150 announced early this year. The 170 has 103-in. wheelbase and a gross weight of 7000 lb.

ARISTOLOY STEELS

LEADED STEELS LATEST INFORMATION

New 16-page booklet presents latest information on basic characteristics, mechanical properties and workability of Aristoloy Leaded Steels. Test results are supported by complete data and charts. Also contains several pages of case histories based on manufacturers' experience and documented by time study records, showing actual savings in reduced machining time and increased tool life.

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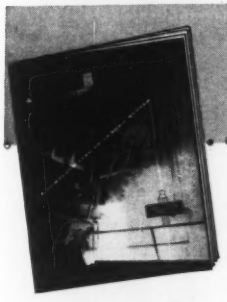

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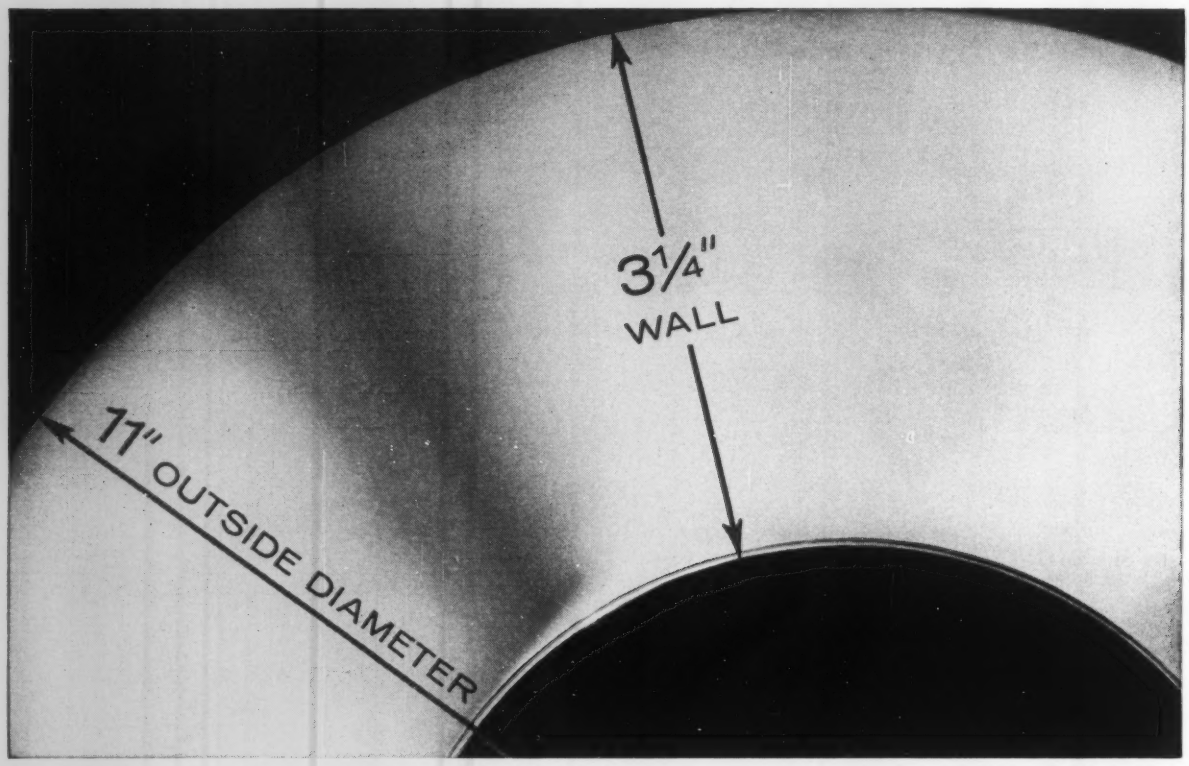

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Now you can get TIMKEN® seamless steel tubing up to 11 inches O.D. with walls up to 3¼ inches thick

WITH the increasing pressures and temperatures needed for higher capacity and efficiency in electric generating plants, more and more engineers are turning to seamless, heavy wall stainless steel tubing. The Timken Company offers a wide range of sizes and grades of pierced heavy wall stainless steel tubing with a maximum of 11" O.D. and 3¼" wall.

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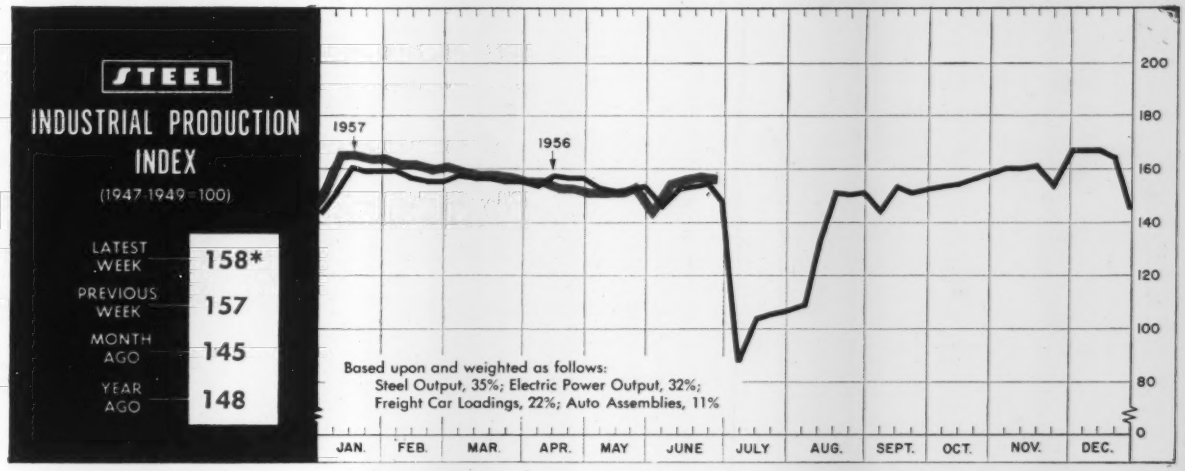


*Week ended June 29.

Inflation: A Basic Part of the Economy

INFLATION is becoming as inevitable as death and taxes, despite all the talk and anti-inflation measures emanating from Washington and the nation's banking centers the last year or two. The "inevitable" got a hefty boost last week when the steelworkers got their scheduled wage increase, and steel companies lifted prices to cover the added costs.

Within two months after the steel producers hiked prices an average of $8.50 a ton to cover increased wages last year, the all commodities section of the Bureau of Labor Statistics' wholesale price index jumped 1.5 percentage points. This year's average increase of only $6 a ton (see page 53) might indicate a somewhat smaller increase in the index. But a careful examination of the facts indicates it could be more.

Case for Increase—Competition has forced many durable goods producers to hold the line on prices since late 1956. Even though increased "extras" boosted steel prices another $5 a ton around the turn of the year, little if any of this was passed on by users of steel. Evidence: In January, the BLS index for machinery and motive products was 143.9 (1947-1949=100); in May, it was 145.0.

In the face of rising material and labor costs, this stability has put the squeeze on profits. Many metalworking companies feel they have absorbed about all they can and must now pass on all the steel price increase.

Testimony—Some comments so far:

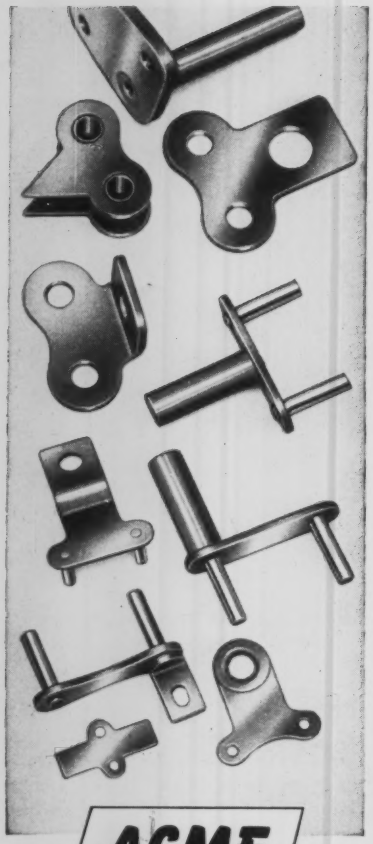
Donn D. Greenshields, president, Pittsburgh Screw & Bolt Corp., Pittsburgh: "We're going to have to pass it all on. We're being hit both ways—the steel price increase and an (automatic) increased labor cost of 20 or 21 cents an hour on July 1."

Wade N. Harris, president, Midland Steel Products Co., Cleveland: "Parts suppliers to the automobile

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,024[1]	2,150	302
Electric Power Distributed (million kw-hr)	12,000[1]	12,337	11,498
Bituminous Coal Output (1000 tons)	10,275[1]	10,300	10,138
Petroleum Production (daily avg—1000 bbl)	7,200[1]	7,237	7,034
Construction Volume (*ENR*—millions)	$330.1	$370.8	$415.9
Auto, Truck Output, U. S., Canada (*Ward's*)	157,399[1]	151,151	135,000
TRADE			
Freight Car Loadings (1000 cars)	745[1]	747	650
Business Failures (Dun & Bradstreet)	241	265	245
Currency in Circulation (millions)[3]	$30,849	$30,904	$30,485
Dept. Store Sales (changes from year ago)[3]	+9%	−2%	+6%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,622	$24,253	$23,358
Federal Gross Debt (billions)	$270.5	$274.5	$272.3
Bond Volume, NYSE (millions)	$21.8	$24.1	$14.1
Stocks Sales, NYSE (thousands of shares)	9,486	10,903	9,000
Loans and Investments (billions)[4]	$87.7	$86.6	$86.3
U. S. Govt. Obligations Held (billions)[4]	$25.6	$25.7	$27.1
PRICES			
STEEL's Finished Steel Price Index[5]	228.59	228.59	210.45
STEEL's Nonferrous Metal Price Index[6]	218.0	218.2	275.7
All Commodities[7]	117.1	117.3	113.8
Commodities Other Than Farm & Foods[7]	125.2	125.3	121.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.



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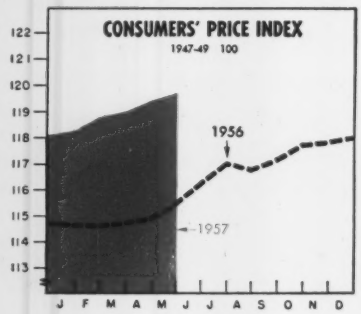
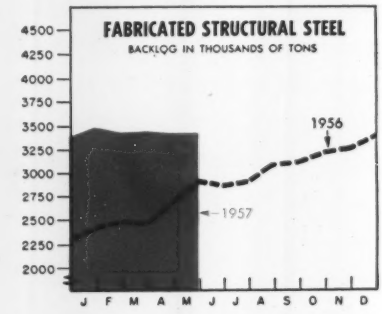
THE BUSINESS TREND



	1957	1956	1955
Jan.	118.2	114.6	114.3
Feb.	118.7	114.6	114.3
Mar.	118.9	114.7	114.3
Apr.	119.3	114.9	114.2
May	119.6	115.4	114.2
June	....	116.2	114.4
July	....	117.0	114.7
Aug.	....	116.8	114.5
Sept.	....	117.1	114.9
Oct.	....	117.7	114.9
Nov.	....	117.8	115.0
Dec.	....	118.0	114.7

U.S. Bureau of Labor Statistics.
Charts copyright, 1957, STEEL.



	Shipments 1957	Shipments 1956	Backlogs 1957	Backlogs 1956
Jan.	262.2	251.5	3,476	2,408
Feb.	278.5	285.4	3,436	2,476
Mar.	305.0	306.8	3,454	2,463
Apr.	313.6	289.6	3,416	2,687
May	329.6	306.2	3,417	2,896
June	....	284.7	....	2,859
July	....	165.5	....	2,904
Aug.	....	213.5	....	3,076
Sept.	....	240.9	....	3,108
Oct.	....	287.6	....	3,215
Nov.	....	276.0	....	3,252
Dec.	....	297.8	....	3,373
Total	....	3,205.5		

American Institute of Steel Construction.

industry cannot absorb the higher costs and, as a result, will have to increase prices."

Westinghouse Electric Corp.'s Steam Division, Essington, Pa., boosted prices on July 5 from 5 to 10 per cent on steam and gas turbines. The cost of steel, other materials and production all have moved up, the company explains.

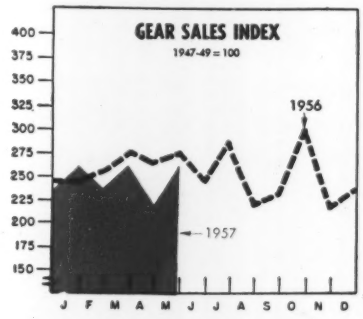
Many steel users, like Pittsburgh Screw & Bolt, are faced with automatic labor cost increases this year, which will place further pressure on them. It all adds up to a reading of about 118.6 for the BLS wholesale price index by August. (It was 117.1 in June.) What happens after that depends to some extent on what the auto companies do. One spokesman said increased steel costs would have no effect on 1957 models and probably none on 1958's. The industry's own labor costs will be the biggest factor, he indicated. (But, it should be remembered that the significant increases in the prices of 1957 models were blamed largely on last year's steel price hike.)

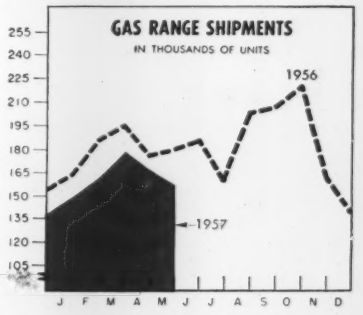
Wholesale to Consumer — The cost of living is almost sure to rocket even higher (see chart above). There is no clear-cut relationship between the wholesale and consumer price indexes. While the wholesale index has held steady so far this year, the consumer index has advanced about 1.5 per cent. Historically, any unusually large increase in wholesale prices is usually followed in about a month by a corresponding increase in consumer prices. So we can expect the cost of living to continue its nine-month rise through the third quarter at an accelerated pace.

Index Rides at High Level

STEEL's industrial production index is riding at its highest level in three months, registering a preliminary 157 (1947-1949=100) for the week ended June 29. The revised figure for the preceding week rose to 158, the highest mark since the week ended Mar. 30. It is not necessarily an indication that industrial production is on the upswing, but it does indicate that summer is here. Since the week ended May 25, the stepped up use of air conditioners has added about 5 points to electric output segment of the index. The other elements have changed little in the last five or six weeks.

Production last week was prob-





	1957	1956	1955
Jan.	259.3	245.5	140.9
Feb.	239.5	256.2	148.5
Mar.	262.4	276.5	172.8
Apr.	221.7	264.7	179.8
May	263.2	275.6	205.2
June	....	245.4	193.5
July	....	286.7	201.7
Aug.	....	219.5	217.6
Sept.	....	230.5	246.5
Oct.	....	299.8	227.6
Nov.	....	216.2	210.4
Dec.	....	235.7	245.5
Avg.	....	254.4	198.3

American Gear Mfrs. Assn.

Shipments—Units

	1957	1956	1955†
Jan.	149,400	163,500	153,400
Feb.	161,700	190,200	186,500
Mar.	179,100	194,400	218,100
Apr.	167,700	176,500	183,200
May	157,200*	179,700	187,700
June	.....	185,300	204,000
July	.....	158,600	146,300
Aug.	.....	202,900	220,000
Sept.	.....	207,300	219,100
Oct.	.....	219,100	210,300
Nov.	.....	161,100	184,400
Dec.	.....	138,700	153,600
Totals	.....	2,177,300	2,226,600

*Preliminary.
†Excluding built-ins.
Gas Appliance Mfrs. Assn.

ably at the lowest point of the year because of the July 4 holiday. Most auto assembly lines were down for two full days, and many metalworking plants planned their annual vacations to start then. The previous low point was 145 for the Memorial day week. The index will rebound this week but will fall far below the level of June.

Construction Awards Soar

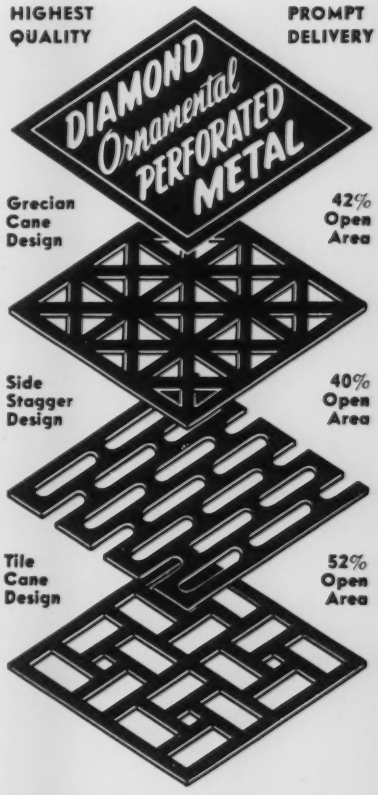
Contract awards for future construction made a comeback in May which pushed the cumulative advantage for 1957 to 4 per cent, says F. W. Dodge Corp. In April, cumulative totals for the two years were practically equal. The total of $3,399,528,000 for May was 14 per cent above the comparable month last year. For the first time in 1957, the dollar value of contracts for one and two family houses rose to the year-ago level. The number of housing units totaled 101,741, down 5 per cent from the May, 1956, figure. The trend toward higher construction costs and larger dwelling units continues. Contracts for nonresidential buildings amounted to $1,119,587,000 in May, 11 per cent higher than the corresponding month last year.

Evidence that construction activity is still one of the basic strengths in our economy: Structural steel fabricators shipped a record 329,626 tons during May (see table, page 72). The old record was 306,760 tons (March, 1956). New orders continue to lag behind the 1956 pace, but backlogs are still at a record level. There are indications that unfilled orders will fall moderately during the last half (see page 129).

Adjustment Rolls On

The Purchasing Agents Association of Cleveland makes this report for June:

"We have seasonal and pre-vacation increases, seasonal and pre-vacation decreases; industries working 50 hours a week, some working four days a week; orders up, orders off; production up and production down. But with all these variations reported by members, the averages still show a sound business economy moving sideways at a high level." In both May and June, 79 per cent of the respondents to the survey reported production better or the same; 79 per cent also reported new orders better or the same.



Need Holes in Metal Sheets?

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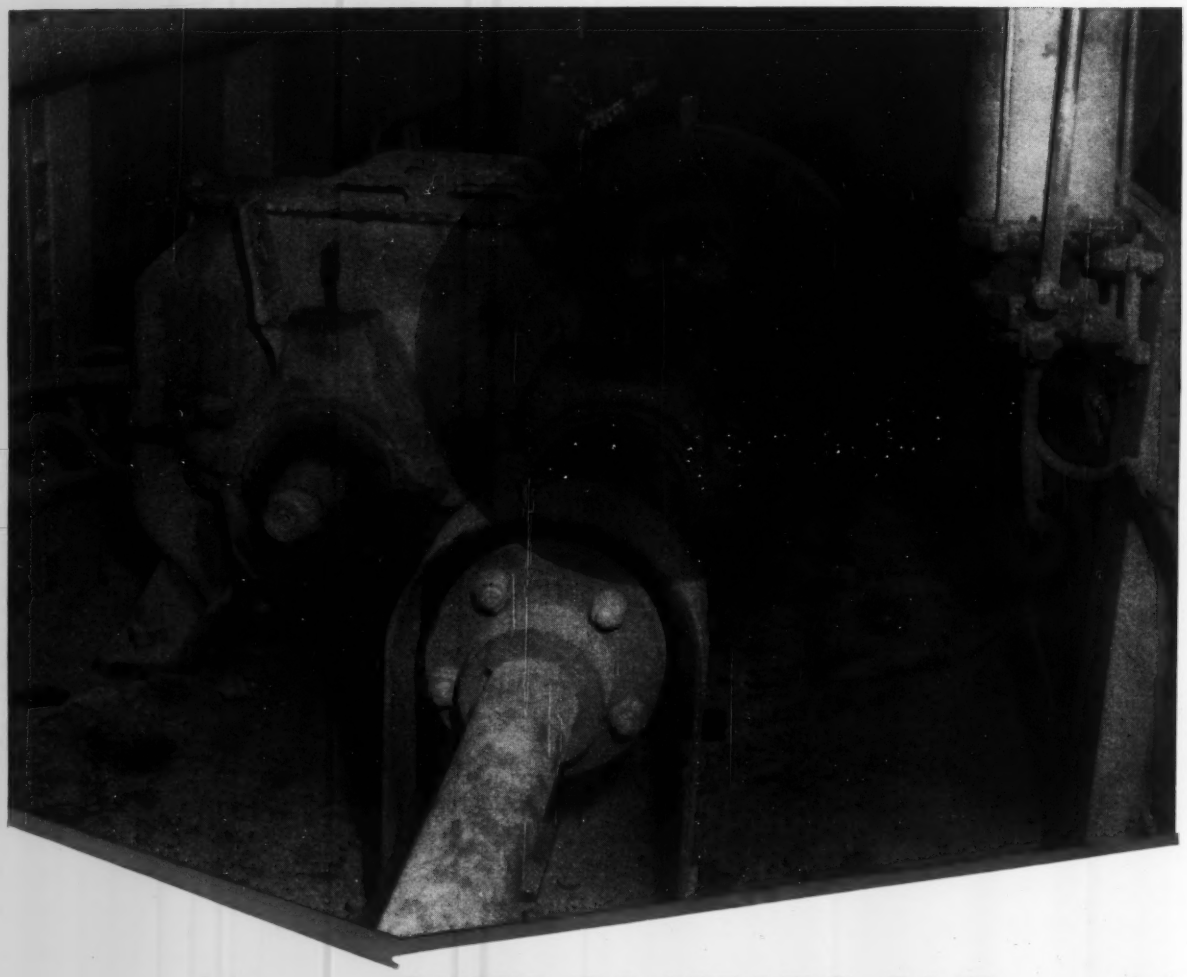

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WEST VIRGINIA: Charleston • Huntington • Wheeling
NEW JERSEY: Camden • **MARYLAND:** Baltimore
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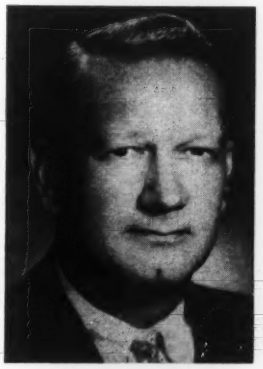
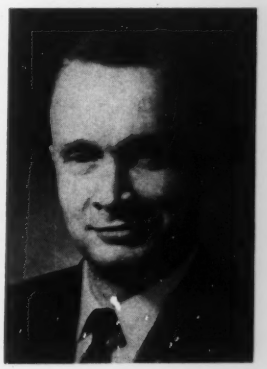


ARNOLD H. HENRIKSEN
plant mgr. for Helipot Div.

A. R. GAUS
Erie Forge & Steel president



A. J. WINCHESTER
joins E. W. Bliss Co.

THEODORE F. MUMMERY JR.
Besly-Welles sales post

Arnold H. Henriksen fills the new post of manager of the Mountainside, N. J., plant of Beckman Instruments Inc.'s **Helipot Division.** A member of the New Jersey staff since 1953, Mr. Henriksen has served as production manager and chief production engineer.

Seymour B. Donner was named plant manager of **Deemer Steel Casting Co.,** New Castle, Del. He was chief manufacturing engineer and assistant foundry manager at Yale & Towne Mfg. Co.

Paul F. Bauder was made assistant general sales manager, **Lewis-Shepard Products Inc.,** Watertown, Mass. He was sales manager for hand lift trucks and stackers. **A. Frank Garbarino** was made division sales manager for hand equipment. He was sales manager for floor trucks and skids.

Farrel - Birmingham Co. Inc. appointed **Harlan J. Hauser** assistant sales manager of its **Consolidated Machine Tool Division,** Rochester, N. Y. He continues as management administrative assistant at the Rochester plant.

Arthur J. Stewart was made works manager, Cressona, Pa., Works, **Aluminum Corp. of America.** He is succeeded as fabricating manager for the Massena, N. Y., Works by **Norman V. Lane.**

Robert I. Warnecke was made executive vice president, **Roberts-Gordon Appliance Corp.,** Buffalo, and **Roberts - Gordon Appliance Corp. Ltd. of Canada.**

Erie Forge & Steel Corp., Erie, Pa., elected **A. R. Gaus** president to succeed **E. H. Lang,** now chairman. Prior to becoming a vice president of Erie Forge in 1955, Mr. Gaus was vice president of Midvale Co.

A. J. Winchester joined **E. W. Bliss Co.** as chief electrical engineer of its rolling mill division, Salem, O. He was with Westinghouse Electric Corp. **A. L. Lind** was made chief draftsman of the division.

Frank J. Hamilton was named general manager, **Bayley Blower Co.,** Milwaukee. He was Chicago district sales manager.

Robert D. Bair was appointed manager of industrial engineering, **Columbus Bolt & Forging Co.,** Columbus, O.

Harold L. McKee was made assistant to the vice president of **Kaiser Metal Products Inc.,** Bristol, Pa. He is in charge of production departments, commercial division.

Fred G. Moser was promoted to manager of original equipment sales by **Johnson Bronze Co.,** New Castle, Pa. He was director of product engineering.

International Resistance Co. elected **F. P. Rice** president of its subsidiary, **Circuit Instruments Inc.,** St. Petersburg, Fla., succeeding **Irwin W. Braun,** resigned. Mr. Rice was manager of the TV receiver division of Allen B. DuMont Laboratories Inc.

Theodore F. Mummery Jr. was made manager of cutting tool sales, a new post at **Besly-Welles Corp.,** South Beloit, Ill. He was district manager for the Cleveland branch office and warehouse.

Harry R. Rowland was elected vice president of wrought iron sales at **A. M. Byers Co.,** Pittsburgh. He was general sales manager.

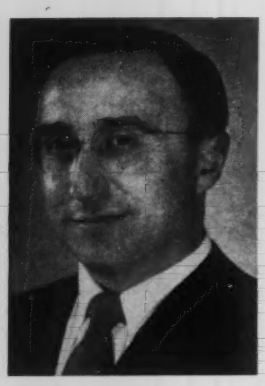
Leon Hurwitz was made product manager, metals processing department, **Hamilton Watch Co.,** Lancaster, Pa. He was chief metallurgist and in charge of the science laboratories. **Eugene P. Barber** was named production manager, clock division. **C. F. Brown** heads the new military products division.

J. W. Keener, executive vice president, will become president of **B. F. Goodrich Co.,** Akron, Aug. 1, following the retirement of **William S. Richardson.**

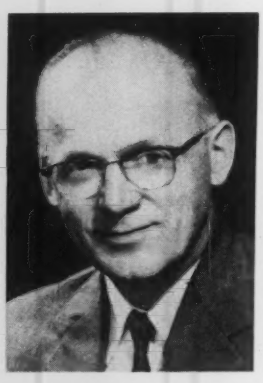
W. J. Mongon was made manager, marine standard products department, **De Laval Steam Turbine Co.,** Trenton, N. J. **J. E. Gutzwiler** was made assistant chief engineer, standard products department, responsible for worm gear and Imo pump engineering.

E. Roy Grant, sales manager of the Rocky Mountain division of **Armco Drainage & Metal Products Inc.,** was named assistant division manager. He is at Denver.

Robert S. Gardner, production manager, was elected vice president of



DONALD M. McDOWELL



ALBERT FEUCHT

Le Roi appointments

WILLIAM A. STEELE

PAUL W. KOENEMUND

Wheeling Steel executive posts

Wyle Laboratories, El Segundo, Calif.

Le Roi Division, Westinghouse Air Brake Co., Milwaukee, promoted **Donald M. McDowell** from acting manager of engineering to manager of engineering. **Albert Feucht** was named manager of the Cleveland plant to replace **Louis E. Dondero**, now manager of Le Roi's main plant at West Allis, Wis.

Paul Thompson succeeds **Harry D. Kuthe**, retired, as general superintendent of **United Engineering & Foundry Co.'s** Youngstown plant. **Robert Wanick** was named assistant superintendent in charge of machine, forge, gear and heat treat departments; **C. V. Kamperman**, assistant superintendent, fitting, repair, electric and carpenter departments and boiler house; **J. N. Nutter**, assistant superintendent, weld shop.

William G. Fetter was named general manager of **Reactive Metals Inc.**, jointly owned by Mallory-Sharon Titanium Corp. and U.S. Industrial Chemicals Co. Division of National Distillers Chemicals Corp. He has temporary offices in New York. The Reactive Metals plant under construction in Ashtabula, O., will be opened this summer.

Neils K. Steenhill was named a project manager of **Rust Engineering Co.**, Birmingham. He is in charge of a steel manufacturing expansion project for Bethlehem Pacific Steel Corp. at Seattle.

Chester C. Lonsdale, assistant to the superintendent, was named superintendent of Hallowell Division, **Standard Pressed Steel Co.**, Jenkintown, Pa.

Gerald T. Hughart was made general manager, **Klemp Metal Grating Corp.**, Chicago. He was with Stearns-Rogers Mfg. Co.

A. L. Dassler was made chief engineer, Koehring Division, **Koehring Co.**, Milwaukee. He is succeeded as assistant chief engineer by **Kenneth Johnson.**

Harold W. Cochran was elected vice president-sales, **Caspers Tin Plate Co.**, Chicago. He was sales manager.

Robert F. Gaylord was made manager of a new Boston district office established in Waltham, Mass., by **Niagara Machine & Tool Works.**

Frederick B. Winther Jr. was made manager of sheet and strip sales at the Cincinnati steel service plant of **Joseph T. Ryerson & Son Inc.** He succeeds **William F. Dagon**, transferred to the new Ryerson plant in Indianapolis.

L. A. Wigley fills the new post of assistant district sales manager at Seattle for **Republic Steel Corp.** He was product supervisor of the company's Union Drawn Division at Chicago.

Walter W. Leahy was made Chicago district sales manager of **DeWalt Inc.**

Cadillac Motor Car Division, Detroit, General Motors Corp., appointed **Nicholas J. Stock** assistant to the manager of purchases; **E. A. Illy**, senior product buyer; **Ralph H. Wahl**, senior nonproduct buyer.

William A. Steele was elected executive vice president, **Wheeling Steel Corp.**, Wheeling, W. Va., a post vacant for several years. He was vice president-operations. **Paul W. Koenemund**, chief engineer, was elected vice president in charge of operations and engineering.

John F. Eaton was made sales manager, **United States Dynamics Corp.**, Boston. He was sales manager at Eastern Air Devices.

Garry P. Sherman was appointed a buyer for **Sitkin's Metal Trading Inc.**, Lewistown, Pa.

Joseph A. Richardson was made plant manager of **Ford Motor Co.'s** new assembly plant at Lorain, O., which is under construction.

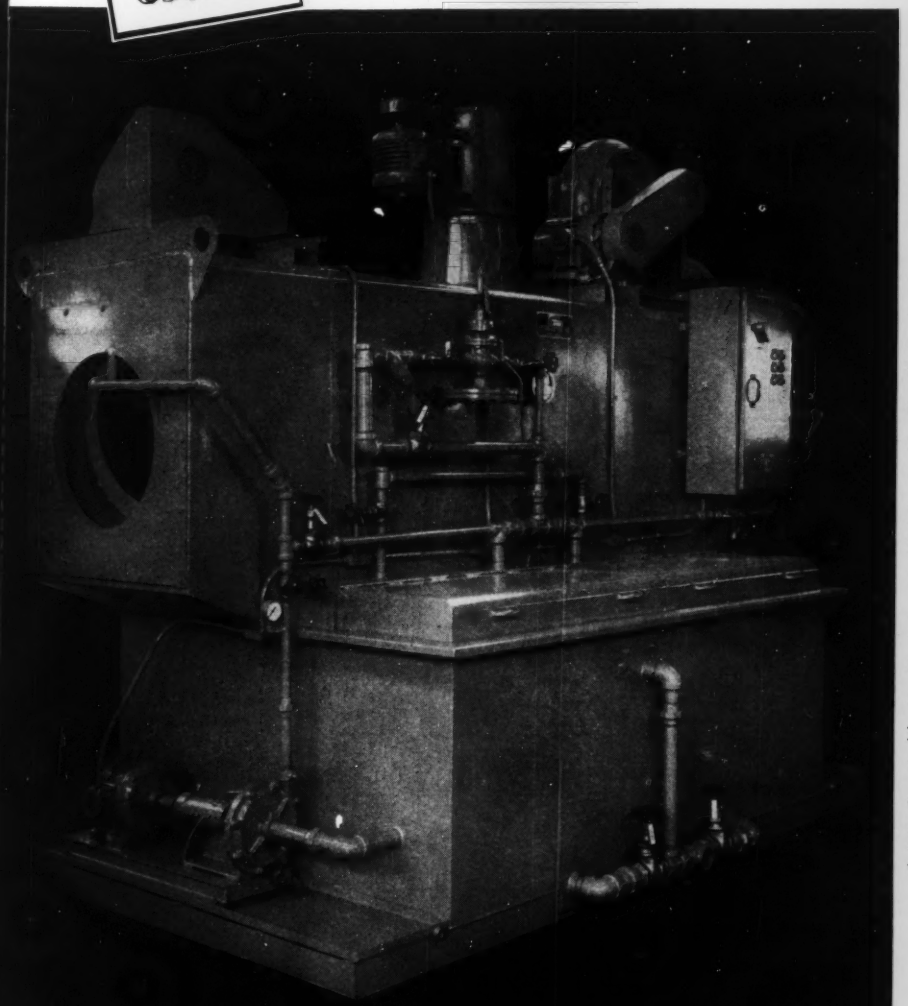
Warren J. Faust was elected vice president - treasurer, **Bridgeport Brass Co.**, Bridgeport, Conn., to succeed **William R. Breetz. Drummond C. Bell** succeeds Mr. Faust as controller. The appointments become effective Oct. 1, the date Mr. Breetz retires. **Stanley Z. Bronner** fills a new post of assistant vice president and director of production and material control for all plants.

Max E. Weeks was made general production superintendent, **American Avionics Inc.**, Culver City, Calif.

Newton Crum was named western regional sales manager for **Chemtrol Corp.**, Compton, Calif.

Leo J. Van Orden was appointed vice president-sales, **Adsco Division**, Yuba Industries Inc., Buffalo. He succeeds **Arthur H. Sy**, promot-

INSURE Efficient Parts Cleaning and Surface Treatment with a POWER SPRAY WASHER by PETERS-DALTON



Typical of the numerous types of P-D Industrial Washing Equipment is this 2 Stage and Blow-Off Helical Drum Washer.

Regardless of the size or weight of your product, the proper cleaning and surface treatment for it can be developed by Peters-Dalton engineers and at lowest cost to you. For more than a quarter century, this organization of specialists has met and exceeded the needs of customers in almost every phase of industry where finishing processes such as these are required.

From single stage to multi stage, Power Spray Washers can be designed, engineered, fabricated and installed by P-D to meet your needs in the most efficient manner. Put your problems in our hands . . . give us your requirements.

Just write, wire or phone . . .
We'll be glad to tell you more.

Representatives
in
principal cities.

- *Hydro-Whirl Paint Spray Booths*
- *Industrial Washing Equipment*
- *Drying and Baking Ovens*
- *Hydro-Whirl Dust Collecting Systems*

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A SUBSIDIARY OF DETROIT HARVESTER CO.
17892 Byron Road · · Detroit 12, Michigan

R. E. LENHARD
Air Reduction Sales exec. v.p.

S. E. BIGGS
Kentucky Mfg. v.p.

S. C. STRATTON
Fageol Products v.p.

ROBERT T. LOUDON
Baker Bros. machine tool post

IVAN C. SENGENBERGER
mgr. of Cyclone Fence

FELIX ZAWASKI
Michigan Tool div. plant mgr.

ed to vice president of the parent company in San Francisco.

Robert T. Loudon was made sales manager, machine tool division, **Baker Bros. Inc.**, Toledo, O.

Ivan C. Sengenberger was appointed manager of **Cyclone Fence** operations for U.S. Steel Corp.'s American Steel & Wire Division at Waukegan, Ill. Formerly general superintendent-production, he replaces **Joseph V. Morrissey**, retired. He is succeeded by **W. F. Fuller.**

Michael G. Kaufman joined **Eastern Metal Converters Inc.**, New York, as vice president and treasurer. Mr. Kaufman was president of Intra Continental Export Co.

John J. Kloskoski was made general service manager at **Davey Compressor Co.**, Kent, O.

Victor J. Kropf was made sales manager, atomic fuel department, **Westinghouse Electric Corp.** in Cheswick, Pa.

Felix Zawaski was made plant manager of **Gear-O-Mation Division**, Michigan Tool Co., Detroit. He was chief engineer.

Joseph J. Bonora was made manager of aluminum sales for **Enos & Sanderson Co.**, Buffalo.

John F. Garvin was made vice president-general manager of west coast operations, **Kinnear Mfg. Co.**, at San Francisco.

W. H. Tock joined **Basic Inc.**, Cleveland, as assistant to the chief engineer. He was with Allis-Chalmers Mfg. Co.

Otis Green was appointed sales engineer for **E. W. Bliss Co.'s** San Jose, Calif., plant. He headed the press service and rebuilding departments at the plant for the last two years.

Dr. Shadburn Marshall was made director of metallurgical research at **Air Reduction Co. Inc.'s** central research laboratories, Murray Hill, N. J.

R. E. Lenhard was elected executive vice president, **Air Reduction Sales Co.**, division of Air Reduction Co. Inc., New York. He is succeeded as president of **Ohio Chemical & Surgical Equipment Co.**, division at Madison, Wis., by **W. A. Lunger.**

S. E. Biggs was elected vice president, **Kentucky Mfg. Co.**, Louisville. For the last five years he was vice president-operations of Youngstown Steel Car Corp.

S. C. Stratton was made vice president-manufacturing, **Fageol Products Co.**, Kent, O. He was with Timken Roller Bearing Co.

Albert B. Nichols Jr. was made sales manager; **Gordon Barlow**, assistant sales manager, tube division, **Sun Tube Corp.**, Hillside, N. J., a subsidiary of American Can Co.

Howard W. Naulty was appointed director of a new research laboratory at **Amherst Mfg. Corp.**, Buffalo.

At the Indiana Harbor, Ind., Works of **Inland Steel Co.**, **Carl C. Mahlie** succeeds **Ernest F. Lundeen**, retired, as superintendent, service department. **Carl F. Schrader** succeeds Mr. Mahlie as assistant superintendent, mill metallurgical division, metallurgical department. **Kurt R. Mattson** was promoted from chief control metallurgist to replace Mr. Schrader as assistant superintendent, open hearth and blooming mill division, metallurgical department.

OBITUARIES...

Walter H. Bowes, 75, a founder and retired chairman of **Pitney-Bowes Inc.**, Stamford, Conn., died June 24 in Washington.

Ervin Gerber, 59, plant manager, **Racine Screw Co.**, Racine, Wis., died June 17.

Roy P. Magarigal, 45, one-time sales manager, industrial division, **Wilkening Mfg. Co.**, Philadelphia, died June 6. He resigned in 1954 to organize his own sales agency through which he continued to represent Wilkening.

IN BUSINESS MACHINES, TOO,

Sharonsteel Quality STANDS OUT

• These machines are encased in Sharonart*—the popular rolled-in surface pattern steel. Sharonart* is one of many steels developed by Sharon engineers during the past half century to help the Business Machine Industry make products look better, work more efficiently and last longer.

To change the style—change the steel to Sharonart Literature and sample kits upon request. **Sharonart*** is a trademark of the Sharon Steel Corporation.

SHARONSTEEL

For 56 Years a Quality Name in Steel

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SHARON STEEL CORPORATION, SHARON, PENNA.

CHICAGO, CINCINNATI, CLEVELAND, DAYTON, DETROIT, GRAND RAPIDS, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, NEW YORK, PHILADELPHIA, ROCHESTER, SAN FRANCISCO, SHARON, SEATTLE, MONTREAL, TORONTO

The news is out!

PRODUCTION VACUUM MELTING OF REFRACTORY METALS AND PRECISION SUPERALLOYS

Lectromelt
is pleased to announce that
LECTROMELT FURNACE DIVISION,
McGRAW-EDISON COMPANY
will manufacture and sell the new
CONSUMABLE ELECTRODE VACUUM MELTING FURNACE
to companies licensed for this production technique by
ALLEGHENY LUDLUM STEEL CORPORATION
or TITANIUM METALS CORPORATION OF AMERICA

Offers 5 important product advantages!

Test results on over 300,000 pounds of various nickel-base and iron-base superalloys hardened by titanium and/or aluminum additions show that remelting under vacuum by the consumable electrode process offers these distinct advantages over direct-arc furnace melted materials:

- Higher degree of cleanliness through removal of non-metallic inclusions and excess gases
- Better compositional homogeneity through freedom from segregation
- Improved workability and ingot soundness resulting in increased yields
- General improvement in mechanical properties
- Large homogeneous superalloy ingots at great speed and relatively low cost

For further details on vacuum remelting by the consumable electrode process or for electric furnace engineering service, write to

LECTROMELT FURNACE DIVISION
McGraw-Edison Company
323 32nd Street, Pittsburgh 30, Pennsylvania

More Steel Rolls

New facilities boost capacity at Avonmore, Pa., plant to 400 tons a month

GENERAL Steel Castings Corp., Granite City, Ill., is adding a manufacturing building to its National Roll & Foundry Division plant at Avonmore, Pa.

Larger Rolls—A 20-ton electric furnace, heat treatment furnaces, a pouring pit and other foundry facilities are being installed. It means the division will be able to cast steel rolls up to 35,000 lb, compared with the present limit of 20,000 lb. The facilities will increase the plant's monthly capacity to 400 tons. (It's 150 tons now.)

The building is the latest stage in an over-all $2-million capital improvement and rehabilitation program at Avonmore, which will be completed by the end of this year. Included are a $250,000 Mesta roll grinder to accommodate rolls up to 45 in. in diameter weighing 60,000 lb and a 50 x 300-in. LeBlond engine lathe, with automatic feed. Extensive rehabilitation of the iron and steel foundries and the roll shop is included.

The plant also makes iron rolls and manganese steel castings for ore crushing machinery, as well as steel castings for power shovels and other heavy machinery.

Enlarges Fabricating Capacity

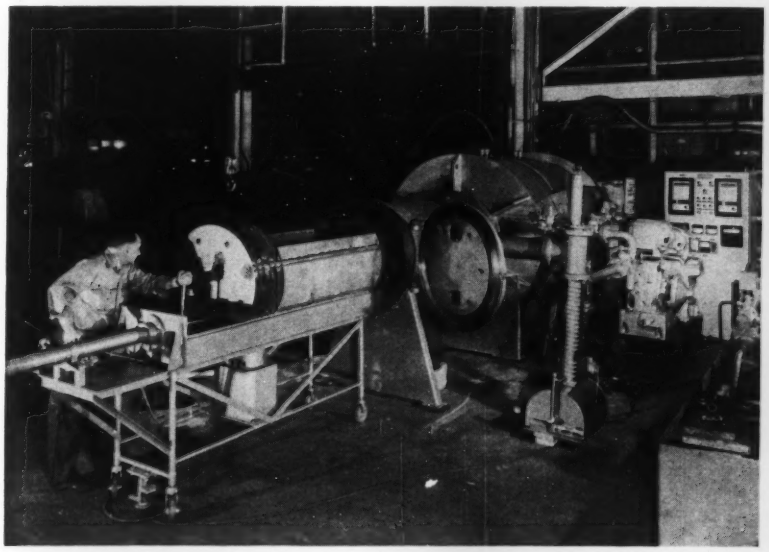
E. J. Codd Co. (heavy machine work), Baltimore, has equipped about 15,000 sq ft of space at 708 S. Caroline St., that city, for fabbricating and welding operations.

Screw Products Firm Expands

Rasmussen Screw Products, Los Angeles, maker of automatic screw machine products, leased a 7000 sq-ft building at 11916 Woodruff Ave., Downey, Calif.

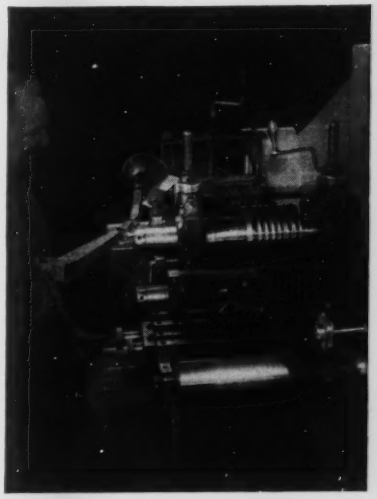
Schedules Refinery Opening

Operations will begin this summer at Reading Metals Refining Corp's $4-million electrolytic copper refinery in Ontelaunee Township, Pa. The new 100,000 sq-ft



Martin Co. Experiments with Vacuum Brazing

This horizontal retort vacuum furnace was installed by Martin Co., Baltimore, to vacuum braze aircraft components. It also can be used for degassing, annealing or other heat treating operations. The unit was built by the Vacuum Equipment Division, F. J. Stokes Corp., Philadelphia. The parts are loaded into the movable boat which is driven into the two-zone vacuum chamber at right by a hydraulic ram. The door is closed; the pressure is reduced; and the temperature is raised to desired levels. After processing, the boat is withdrawn into the cooling zone. Controlled cooling of the work is also under vacuum



YODER SLITTERS
Supply
Varied Strip Widths for
Tinnerman *Speed Nuts*®

Tinnerman Products, Inc., Cleveland, Ohio, produces more than 10,000 different shapes and sizes of "SPEED NUT" brand fasteners for industry . . . many of them to special specifications.

To do this, Tinnerman uses slit steel strands ranging in width from ⅛" to 7½". To carry an inventory of the many strip widths required to meet normal and unusual demands would be almost impossible.

Tinnerman overcomes these inventory and supply problems by doing their own slitting on two Yoder slitters. This enables them to supply the plant with any strip size required from a relatively small inventory of 6" and 9" width purchased coils. In slitting narrow strands, such as these from small coils, a Yoder slitter may be profitable on a production as low as 25 tons per month.

Here is a fine example of how a small investment in Yoder slitting equipment greatly simplifies and speeds production while effecting important operating economies.

The saving made in time alone, reflects in better customer service through faster completion and delivery of finished products.

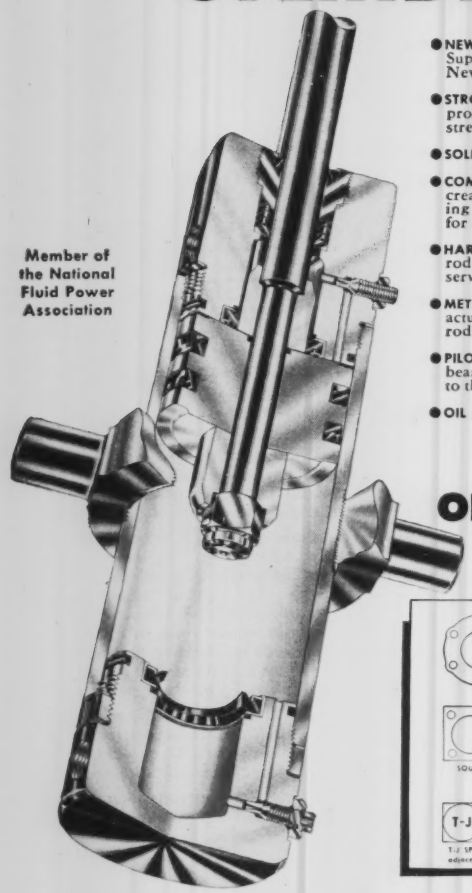
If your steel strip or sheet slitting requirements are as low as 100 tons per month or even less, a medium size Yoder slitter can be a very profitable investment for you. The Yoder line includes units of every size and capacity . . . of the most advanced engineering design. Send for the Yoder Slitter Book —a comprehensive text on the mechanics and economics of slitters and slitting line operation, with time studies, cost analyses and other valuable data. Write to:

THE YODER COMPANY
5502 Walworth Avenue • Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING
ROTARY SLITTING LINES

all the EXTRAS are standard with

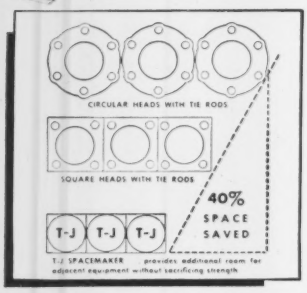
T-J Spacemaker CYLINDERS



Member of the National Fluid Power Association

- **NEW** *exclusive* ingenious cushion designs . . . Super Cushion Flexible Seals for Air . . . New Self-Aligning Master Cushion for Oil.
- **STRONGER** than outmoded tie rod design, proven through actual tests. No tie rods to stretch.
- **SOLID STEEL HEADS** throughout the full line.
- **COMPACT DESIGN** eliminates tie rods, increasing the strength and reducing mounting space required, providing extra room for adjacent equipment.
- **HARD CHROME PLATED** body bores and piston rods . . . assure you of long trouble-free service. (Standard at no extra cost.)
- **METALLIC ROD SCRAPER**, not just a wiper, actually removes foreign matter from the rod.
- **PILOTED PACKING GLAND** with extra long bearing. Additional strength and support to the piston rod.
- **OIL** pressure to 750 p.s.i. AIR to 200 p.s.i.

DELIVERY OFF THE SHELF!



You *save 40% space* when you switch from outmoded tie rod cylinders to the T-J Spacemaker! It's stronger, too! Fits right into automation programs in countless plants. Delivers top performance and dependability with a big *plus* in advanced features. Wide range of styles, capacities . . . reduces man-hours and costs in all kinds of push-pull-lift jobs. Off-shelf delivery in 64,000 combinations!

NEW LITERATURE—Send today for new Catalog SM56 with complete engineering details on Spacemaker line. Write The Tomkins-Johnson Co., Jackson, Mich.

T-J TOMKINS-JOHNSON
DIVITORS . . . AIR AND HYDRAULIC CYLINDERS . . . CUTTERS . . . CLINCHORS

refinery (capacity, about 1200 tons a month) will turn out 99.95 per cent copper billets for drawing into tubes.

Great Lakes Carbon Expands

Electrode Division, Great Lakes Carbon Corp., New York, is constructing a pilot plant at Niagara Falls, N.Y. The facility will duplicate every unit of carbon and graphite production. It will turn out new and improved graphite and carbon products for research and development.

Crucible Builds Warehouse

Crucible Steel Co. of America, Pittsburgh, is building a 75,000 sq-ft warehouse-distribution center and sales and administration offices at Solon, O. The center will facilitate distribution of tool, stainless and other specialty steels to fabricators in the Cleveland area.

Forms New Jersey Firm

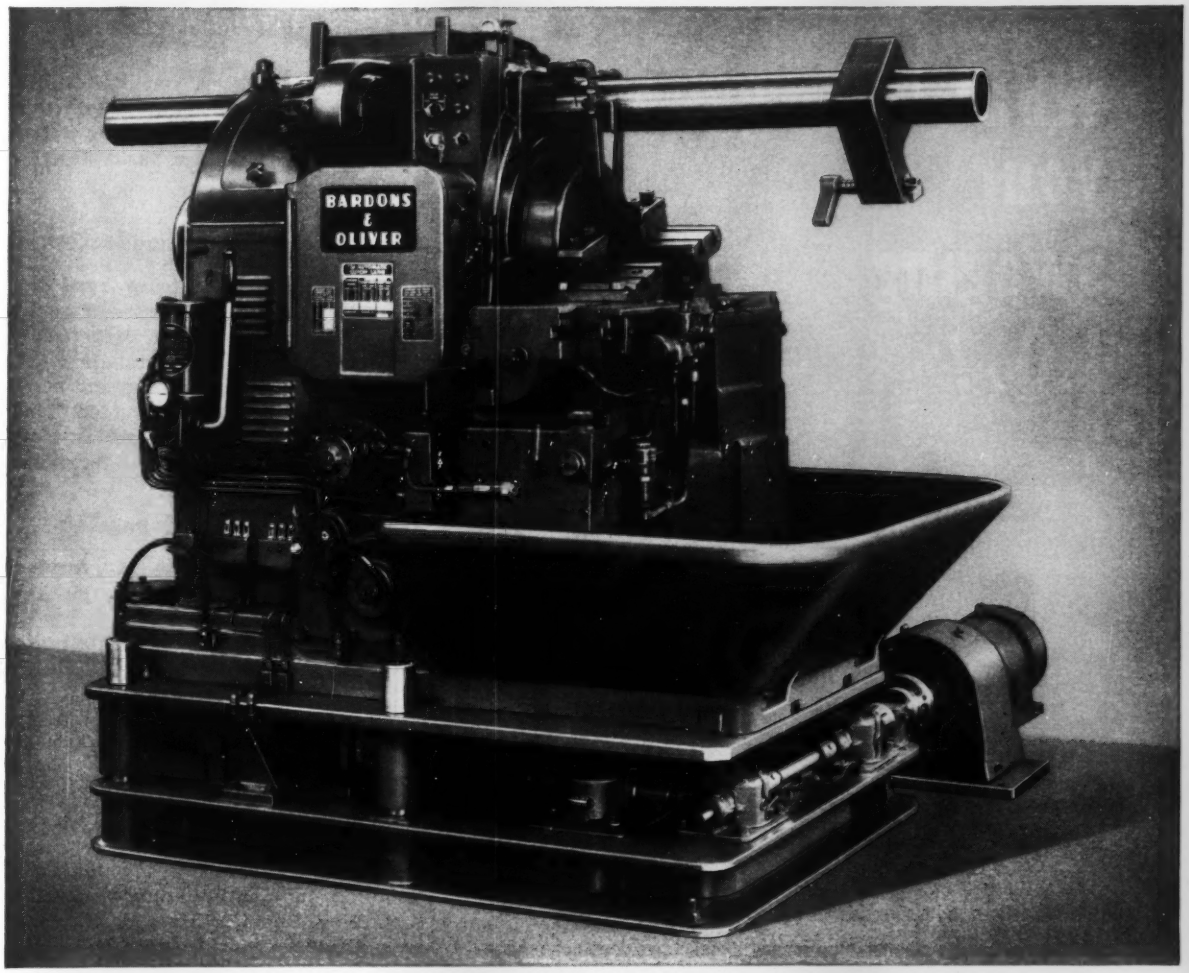
Jack Dougherty has resigned as general manager of Albert Pipe Co., Brooklyn, N. Y., and established his own company, Associated Pipe & Fitting Co., Cedar Grove, N. J.

Cross Co. Issues Licenses

Cross Co., Detroit, producer of automation machinery, licensed these firms to build its machine control unit: Scully-Jones & Co., Chicago; Seibert & Sons Inc., Chenoa, Ill.; Royal Design & Mfg. Inc., Detroit.

IT&T Offers Testing Service

A new standards laboratory for testing and certifying master mechanical and electrical measuring devices has been opened at 100 Kingsland Road, Clifton, N. J., by the International Telephone & Telegraph Corp., New York. It is equipped to provide manufacturers with certified standard testing of threaded ring gages and set plugs, plain and tapered plugs and rings; gage blocks, thread-measuring wires, master gears, precision threaded parts, cylindrical and tapered parts. The laboratory also can measure contours, precision circles, surface finish, hardness,



ANOTHER *Leading Steel Mill Reorders* BARDONS & OLIVER Cutting-Off Lathes

Lone Star Steel Company, Dallas, Texas, established the first electric-weld casing, tubing and line pipe mill in Texas in 1953. Their consulting engineers recommended Bardons & Oliver equipment. The fourteen Bardons & Oliver Cutting-Off Lathes purchased at that time have cropped and chamfered the entire pipe output to date and performance has been reported as entirely satisfactory.

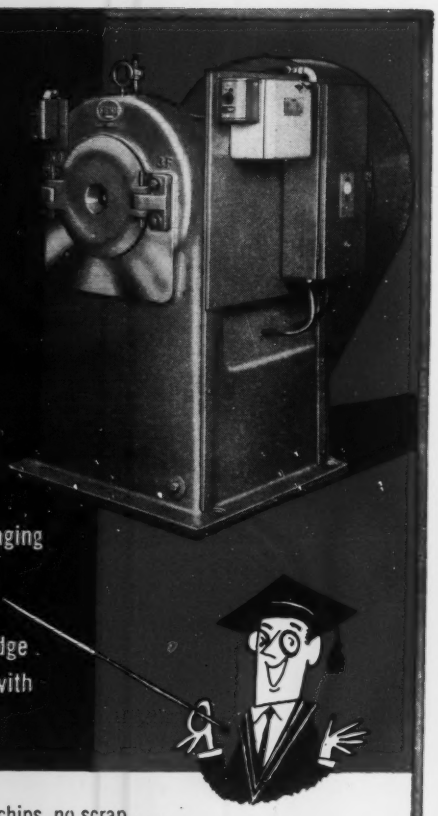
A second purchase order for four more Bardons & Oliver Cutting-Off Lathes complete with loading tables implements a current expansion program. The first additional pair of Cutting-Off Lathes put into operation last month is producing at a higher rate than anticipated.

The illustrated No. 36 Cutting-Off Lathe is one of several used by Lone Star Steel Company. Eight sizes are available ranging in capacities from 2" to 16" diameter, in either full automatic, semi-automatic or hand operated.

BARDONS & OLIVER, INC.

1147 WEST 9TH STREET • CLEVELAND 13, OHIO

What is your swaging I.Q.?



Are you aware of the new techniques and equipment that are making rotary swaging increasingly important as a basic precision production process? Test your knowledge of modern rotary swaging with this TRUE or FALSE quiz.

SWAGING is economical—no chips, no scrap . . .

SWAGING produces work accurate within ± .001" . . .

SWAGING improves physical characteristics . . .

SWAGING can produce inside contours . . .

SWAGING can be automatic or semi-automatic and does not require skilled labor for operation . . .

FENN is one of the largest manufacturers of a complete size range of swaging equipment . . .

FENN swaging equipment swages tubing up to 6¼" diameter and solid bar stock from pinpoint to 3¾" diameter . . .

If you answered TRUE to all the questions, your knowledge is excellent. If not, you should have more information on modern rotary swaging.

In either case, it will pay you to get a copy of the new Fenn Swaging Catalog No. SM56. Write today!

FENN ROTARY *Swaging Machines*

THE FENN MANUFACTURING COMPANY 403 FENN ROAD, NEWINGTON, CONNECTICUT

flatness and a variety of other mechanical configurations and qualities.

Electrically, it can provide precise measurements of voltage, current, resistance, frequency, capacitance and similar basic electrical units.

Republic Bonderizing Lockers

Bonderizing is being applied to steel lockers manufactured by Republic Steel Corp.'s Berger Division, Canton, O. Installation of a $1.5-million Bonderizing and painting unit has been completed. Bonderizing is a metal surface treatment that inhibits rust formation.

Fairchild Engine Expanding

Fairchild Engine & Airplane Corp., Hagerstown, Md., plans to construct: Three buildings for the Aircraft Division in that city; an engineering office for the Engine Division in Deer Park, N. Y.; and a 23,300 sq-ft addition to the Stratos Division plant at Bay Shore, N. Y.

Enlarges Wire Rope Facilities

A new wire drawing mill is being built at St. Louis by Leschen Wire Rope Division, H. K. Porter Company Inc., New York. It is scheduled to be in operation in December. Cost of the alterations and extensions to the present facilities is estimated at $1.7 million.

Will Evaluate Gear Alloys

General Electric's Small Aircraft Engine Department, Lynn, Mass., has received a $41,000 contract to study and evaluate alloys for high temperature gear applications. The contract was awarded by the Air Development Center, Wright Field, Dayton, O. It calls for analysis of several materials to determine their hardness properties and other characteristics up to 700°F.

Foreign Trader Changes Name

Japan Cotton & General Trading Co. Ltd., Osaka, Japan, changed its name to Nichimen Co. Ltd. The major associate office in the United States is at 39 Broadway, New York 6, N.Y. This office is

(Advertisement)

SPECIAL REPORTS ON FINISHING NON-FERROUS METALS

NUMBER III—Lustrous, Corrosion-Resistant Finishing with Chemical Polishing Iridite

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Chromate conversion coatings are widely accepted throughout industry as an economical means of providing corrosion protection, a good base for paint and decorative finishes for non-ferrous metals. Certain of these coatings also possess chemical polishing abilities that have luster-producing, as well as corrosion-inhibiting, effects on zinc and cadmium plate, zinc die castings and copper alloys. However, continued developments in this field have been so rapid that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this discussion of the many ways in which this chemical polishing characteristic can be used in final finishing or pre-plating treatments to produce a lustrous appearance with distinct display and sales appeal and appreciable savings in cost. Report I on decorative, corrosion-resistant finishes and Report II on paint base corrosion-resistant finishes are available on request.

The degree of luster possible on a surface is a function of the degree to which the surface can be smoothed. Leveling to provide a smooth surface can be achieved by mechanical or chemical means, or a combination of these, depending upon the luster desired and the original condition of the metal. Chemical polishing effectively imparts luster otherwise difficult and costly to obtain. For this reason, it is often used to supplement or entirely replace mechanical polishing, depending upon the application and the original condition of the metal. Chemical polishing has the additional advantage of providing overall treatment of the submerged part. It reaches into even the deepest corners and recesses that are otherwise inaccessible. Certain of the Iridites are specifically designed to perform this chemical polishing operation. Also, they provide corrosion protection as do all Iridites, thus may be used as a final finish or a pre-plating polish.

If Iridite is to be used as a final finish, in contrast to pre-plating treatment, the chromate conversion coating generated is allowed to remain, providing good corrosion resistance. Color inherent in these Iridite films ranges from a yellow cast to yellow iridescent. These coatings may be used without further treatment where this color is acceptable and good corrosion resistance is desired. Further, these basic coatings can be tinted by dyeing. Among the dye tints available are shades of red, yellow, blue and green. If desirable, the basic coatings can also be modified by a bleach dip leaving a clear bright or blue iridescent finish. In all cases bleaching reduces corrosion resistance.

As examples of this type of final finishing, Iridites #4-73 and #4-75 (Cast-Zinc-Brite) make possible for the first time, lustrous chemical polishing of the as-cast surface of zinc die castings. Thus, in many cases, sizeable savings in finishing cost are realized by elimination of plating costs. This economical method can be used on tools, appliance parts, toy pistols, locks and many other small castings. Another example is the treatment of copper and brass parts, such as welding tips, to eliminate buffing and provide additional corrosion resistance. In many cases, handling costs are reduced appreciably by replacing piece-part handling with bulk processing. Still another example of the use of this chemical polishing and protective quality of Iridite is a simple system of zinc plate, Iridite and clear lacquer instead of more costly electroplated finishes. Typical of this type of lustrous finish are builders hardware and wire goods.

As a pre-plating treatment, in contrast to final finishes, Iridite can be used to chemically polish zinc die castings or copper prior to plating. In such cases, Iridite should be applied as an in-process step, so that the protective film is removed before the plating cycle. The savings in handling, material and labor costs are obvious. This process has made it practical to plate chrome directly over copper on steel, conserving nickel, yet producing a lustrous chrome finish. Used after stripping faulty plate in reprocessing zinc die castings, Iridite restores luster to the casting, thus making possible replating without blistering.

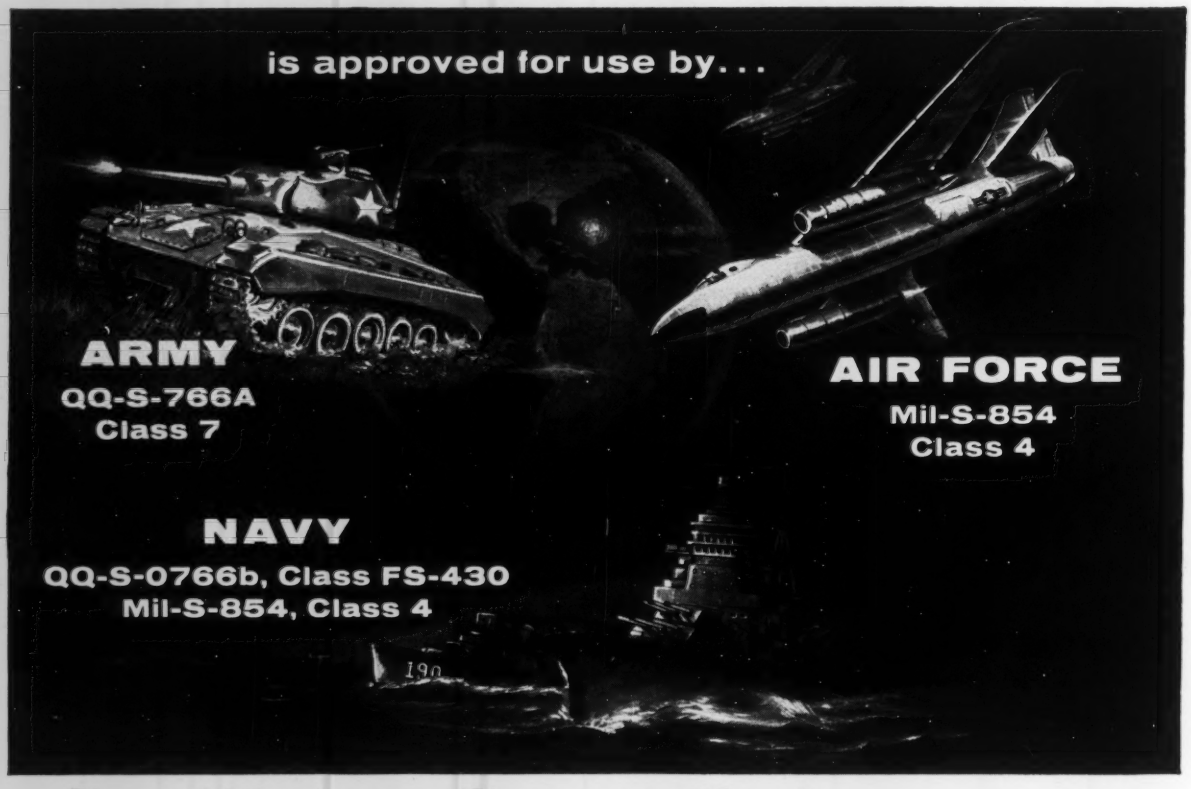
Other Iridite finishes are available to produce maximum corrosion resistance, a wide variety of decorative finishes and excellent bases for paint on all commercial forms of the more commonly used non-ferrous metals. As a final finish, appearance ranges from clear bright to olive drab and brown and many films can be bleached or dyed. As a paint base Iridite provides excellent initial and retentive paint adhesion and a self-healing property which protects bare metal if exposed by scratching. Iridites have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

Iridites are widely approved under both Armed Services and industrial specifications because of their top performance, low cost and savings of materials and equipment.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product demands the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 East Monument Street, Baltimore 5, Maryland.

MicroRold® 430

the general utility STAINLESS STEEL



Since 430 meets military specifications, why not investigate this grade for your product

This straight chromium stainless grade possesses desirable qualities of beauty, corrosion resistance, strength, long life and low maintenance that are also of value in many civilian applications. More than 50% of all stainless applications could satisfactorily employ 430 stainless as an economical and practical material. Type 430 stainless costs 10¾ cents per pound less than the 18-8 grade. Some of our customers are already saving more than $215 per ton using our MicroRold 430 stainless sheet. Why not investigate the possibilities of this general utility 430 stainless.

Send today for your copy of our 24-page booklet, "MicroRold 430 Stainless Steel Handbook."

***MicroRold* 430 sheets** are available up to 48″ wide as thin as .010″, and up to 36″ wide as thin as .005″ in commercial finishes and tempers.

Washington Steel *Corporation*

7-0 Woodland Avenue, Washington, Pa.

becoming increasingly important in the export-import of steel, pig iron, tin plate, other metals and related products.

Erects Casting, Molding Plant

Precision Castparts Corp. has completed a $125,000 casting and small molding plant at 4600 S.E. Harney Drive, Portland 6, Oreg. The 21,000 sq-ft building houses offices, engineering department, tool and die shop and metallurgical laboratory, as well as quality control and production facilities. The firm specializes in production of alloy and stainless steel parts for the aircraft, missile and electronic industries.

Builds Testing Facility

Martin Co., Middle River, Md., is erecting a $3.1-million aircraft structural test fixture.

Armco Dedicates Plant

Armco Drainage & Metal Products Inc., subsidiary of Armco Steel Corp., Middletown, O., dedicated its $1.7-million plant which will turn out a new line of all-steel, clear-span buildings. The new product gives the company five basic kinds of buildings in more than 5000 sizes.

Gisholt Forms Subsidiary

Gisholt Machine Co., Madison, Wis., organized a subsidiary in England to be known as Gisholt Machine Co. (Great Britain) Ltd. The organization will subcontract balancing and superfinishing machines to be made for overseas markets. Operating out of the London office will be Albert E. La Grille, managing director, and Hobart S. Johnson II, director and general manager.

Truscon Steel Expanding

Construction of $3 million worth of facilities at Republic Steel Corp.'s Truscon Steel Division plant in Niles, O., is well under way. The facilities will turn out steel bar joists and roof deck, supplementing Truscon's facilities at Youngstown where a $1-million ex-

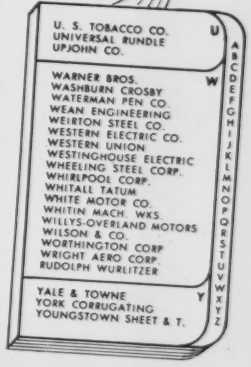
(*Please turn to page* 90)

Logan Roller Conveyor system speeds packing and shipping operations for leading producer of aluminum. Transfer cars connect storage lines in bays at right to main line at left. Weighing in transit is accomplished with scale sections.

The LEADERS use Logan

The mark of a leader is—"ability to deliver the goods." In more ways than one, Logan Conveyors aid the nation's leading industries to do just that. Logan equipment makes important intra-plant deliveries, linking up all production operations into one efficient whole. And these conveyors, built to convenient working heights, save bending, lifting and straining, too. Remember you get value-plus, that something-added when you specify Logan-engineered conveying equipment. Write today to—

LOGAN CO., 535 CABEL ST., LOUISVILLE 6, KENTUCKY



Logan Conveyors

HOW TO HANDLE THE

No "heft" too heavy for brawny, beefy Republic Steel Storage Equipment. It's built to handle the heavyweights—and how! Shelving and racks made by Republic's Berger Division turn static storage facilities into dynamic materials movement centers. Republic Storage Engineering specialists will help you apply this superb equipment to your materials movement problems . . . show you how to handle the heavyweights. Send coupon.

REPUBLIC SECTIONAL BAR RACKS. Each upright supports 40,000 pounds of bar stock, shafting, pipe, when loaded both sides. Load it, unload it from either end or either side. Handles short or long stock with equal ease and convenience. Made to any desired length in multiples of 35- or 70-inch units. Uprights are 96 inches high, with 11-inch brackets adjustable at six-inch intervals.

WEDGE-LOCK LONG-PARTS RACK. None stronger! Patented Wedge-Lock construction grips tighter as load is increased. Load it and unload it from either end. Safe, sure storage . . . capable of carrying enormous weight . . . and classifying stock so that it can be put into production fast. Built for heavy-duty applications from economical standard Wedge-Lock posts and "U" bars. Send coupon for catalog.

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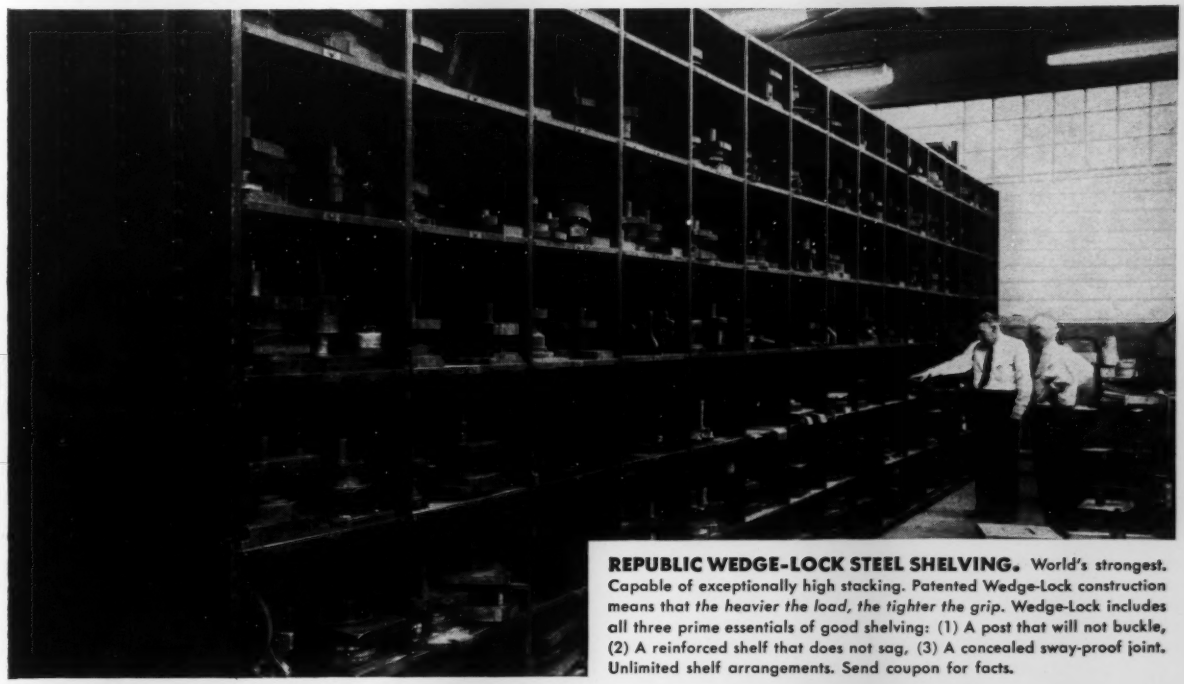
REPUBLIC STEEL

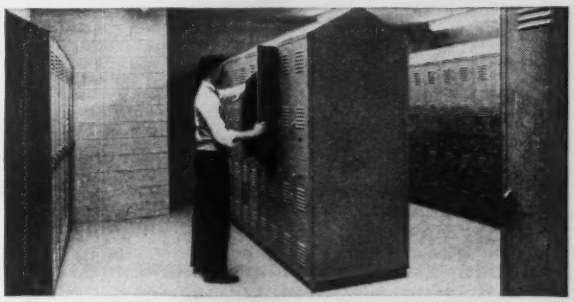
World's Widest Range of Standard Steels

HEAVYWEIGHTS:



REPUBLIC WEDGE-LOCK STEEL SHELVING. World's strongest. Capable of exceptionally high stacking. Patented Wedge-Lock construction means that *the heavier the load, the tighter the grip.* Wedge-Lock includes all three prime essentials of good shelving: (1) A post that will not buckle, (2) A reinforced shelf that does not sag, (3) A concealed sway-proof joint. Unlimited shelf arrangements. Send coupon for facts.

INSERTS, DRAWERS, SHELF-DIVIDERS, and accessories to fit Republic Wedge-Lock and Republic Convertible Shelving. All designed to solve every small-parts storage problem, to simplify inventories, prevent loss, speed handling and parts finding. Republic Storage Engineering Specialists will help you select and lay out the shelving equipment you need most efficiently and economically.



REPUBLIC STEEL LOCKERS. Happy solution to personal storage needs of personnel . . . indispensable wherever clothing must be changed or stored. Safe, pilfer-proof, tamper-proof. Wide choice of styles and locking mechanisms. Bonderized for lasting paint adherence and resistance to damage. Republic's Berger Division will help you plan your new or enlarged locker system and can handle all installation details. Write for facts.

STEEL

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Please supply additional information on the following:

☐ Wedge-Lock Steel Shelving ☐ Sectional Bar Racks
☐ Wedge-Lock Long-Parts Rack ☐ Inserts, Drawers, Dividers
☐ Republic Steel Lockers

Name_____ Title_____

Firm_____

Address_____

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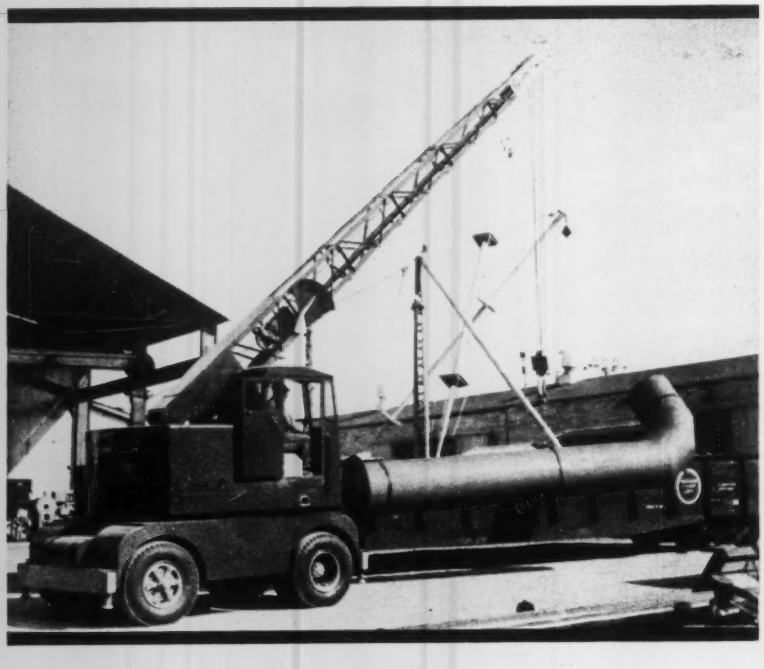
Take a load off the operator's mind with Coles "no-over-the-head" handling



Coles cantilever boom does not permit the load to pass over the operator's head. Short wheel base and short tail swing allows entire cab to revolve with load and still provide close-quarter handling.

COLES
CRANES
JOLIET 7, ILLINOIS

WRITE FOR BOOKLET "101 Cost-Cutting Ways"

Now, available L. P. G.-, diesel-, or gasoline-electric powered in capacities from 5 to 50 tons. Available on long term lease arrangements.

(*Concluded from page 87*)

pansion of metal lath production capacity was completed recently.

Hoover Ball & Bearing Expands

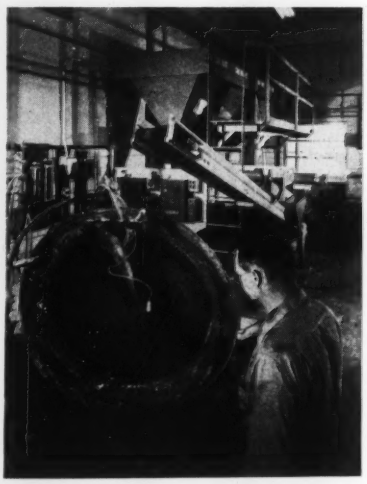
Hoover Ball & Bearing Co., Ann Arbor, Mich., is erecting a $1.5-million plant southwest of that city. It will provide 200,000 sq ft of space and is expected to double the firm's output of balls and bearings. The firm operates diecasting plants in Adrian, Fowlerville and Saline, Mich., and Malvern, Ark.

Starts Nuclear Power Station

Commonwealth Edison Co. and associated companies have started construction of a $45-million nuclear power station at Dresden, Ill. It is privately financed.

CONSOLIDATIONS

Jervis B. Webb Co., Detroit, purchased the **Spanmaster Crane Co.**, Los Angeles, producer of crane and monorail systems. Webb also



Dravo Broadens Research

A sintering laboratory is one of seven major facilities at Dravo Corp.'s new $500,000 research center on Neville Island, Pa. Others are for metallurgical, chemical, physical testing, heater, concrete and marine research. The model sintering and pelletizing machinery (above) is helpful in determining the size machine a customer requires and for tests of materials to be pelletized

has acquired 34,000 sq ft of manufacturing facilities in Detroit.

Davidson Enamel Products Co., Lima, O., has merged with **Fenestra Inc.,** Detroit. Davidson produces porcelain enamel sheets for exteriors of buildings and will be operated as a subsidiary of Fenestra.

ASSOCIATIONS

Resistance Welding Alloy Association, Philadelphia, elected these officers: President, Walter A. Cox, W W Alloys Inc., Detroit; vice president, J. A. O'Grady, Weldalcy Products Co., Van Dyke, Mich.

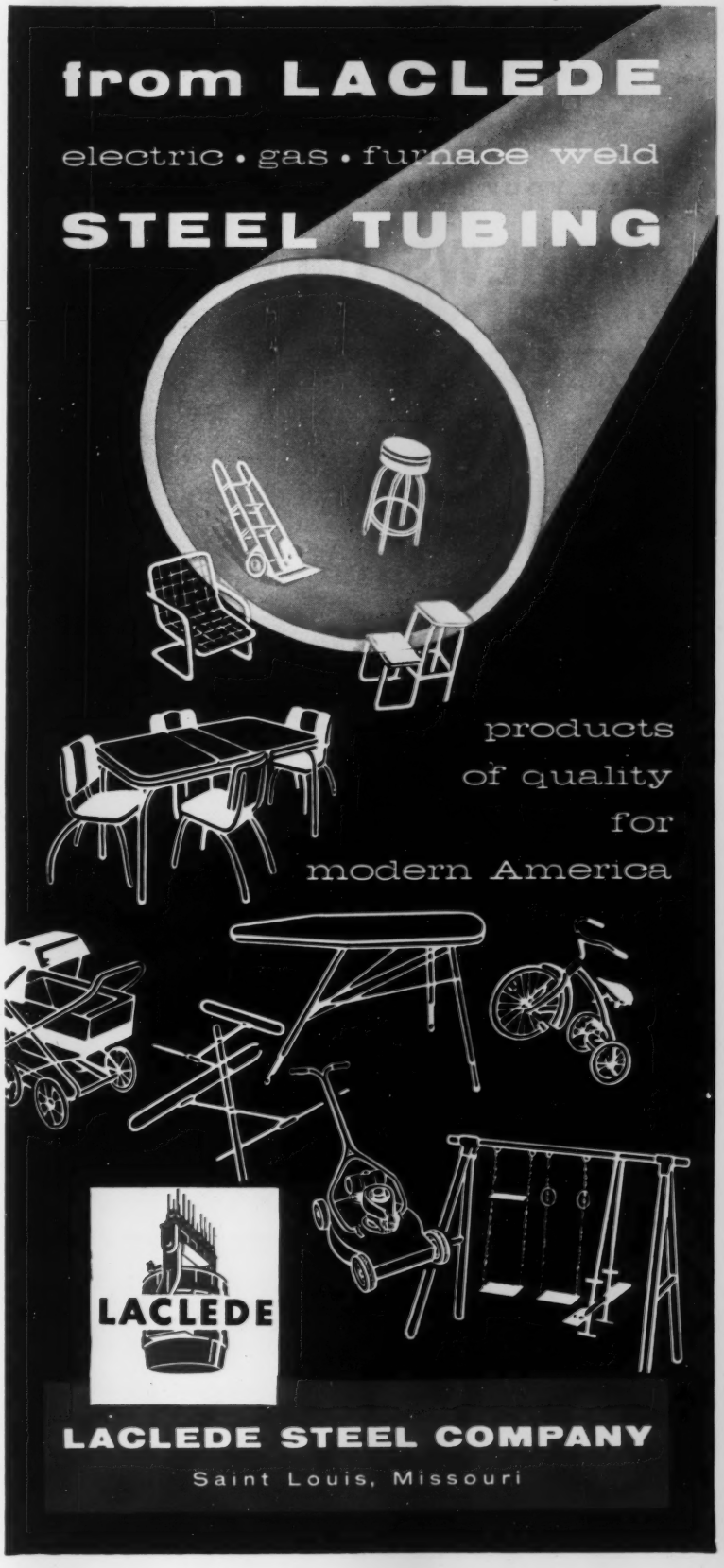
Blast Furnace & Coke Association of the Chicago district elected these officers: President, C. W. Bruce, Republic Steel Corp.; vice president, H. R. Nicklaus, Interlake Iron Corp.; secretary-treasurer, R. P. Wheatley, Wisconsin Steel Works of International Harvester Co.

Purchasing Agents Association of New York Inc., New York, elected D. S. Gibson, Worthington Corp., Harrison, N. J., president. Other officers are: First vice president, F. S. Romanse, Babcock & Wilcox Co.; second vice president, G. W. Baker, Port of New York Authority; treasurer, L. A. Norris, New York Stock Exchange.

James N. Landis has been nominated president of the **American Society of Mechanical Engineers,** New York. He will be installed in December after a letter ballot.

John Cameron Fox was appointed secretary of the **Society of Mining Engineers** of the American Institute of Mining, Metallurgical & Petroleum Engineers Inc., New York. Mr. Fox was assistant manager of the Mining Division, American Metal Co. Ltd., New York.

New officers of the northern Ohio chapter, **American Steel Warehouse Association,** Cleveland, are: President, W. H. Peterson, Republic Structural Iron Works; vice president, A. F. Besch, Pater-



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for your money when you buy

MATHEWS CONVEYERS

A system of double-deck live roller conveyers handling tote pans in a modern machine shop. Pans are deflected to the machines off the top deck. Empties return on bottom deck.

Whatever the conveying problem might be—whether it involves the handling of coils, sheets, or the fabricated product—Mathews builds the equipment to do the job in the best way. You can be sure of a complete service from planning through installation. You get the benefit of over 50 years of experience in **continuous flow** materials handling, and a product that is guaranteed to stay on the job. That is why we believe you get the most for your money when you buy Mathews Conveyers.

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MATHEWS

Fifty Years of Leadership in Mechanized Handling

son-Leitch Co.; secretary-treasurer, H. D. McQuown, Solar Steel Corp., all of Cleveland.

Drop Forging Association, Lansing, Mich., re-elected these officers: President, C. H. Smith Jr., Steel Improvement & Forge Co., Cleveland; vice president, G. R. Walker, Walker Forge Inc., Racine, Wis.; executive vice president, D. M. Allgood; and assistant secretary, treasurer, Richard Marcus.

NEW ADDRESSES

Carlson Co., consulting engineers and machine designers, moved to 3457 Weidner Ave., Oceanside, Long Island, N. Y.

Heyward - Robinson Engineering Co. moved its offices to 114 Liberty St., New York 6, N. Y. The firm is a diversified architect-engineering organization, specializing in the industrial field.

Ballymore Co. moved to enlarged quarters at Lincoln and Garfield avenues, West Chester, Pa. The firm makes hydraulic lifts, mobile work platforms and safety ladders.

American Brake Shoe Co. moved its offices to 530 Fifth Ave., New York 36, N. Y.

REPRESENTATIVES

Revere Copper & Brass Inc., New York, appointed Elkhart Bridge & Iron Co., Elkhart, Ind., as its aluminum products distributor in that area.

Carl F. Popper Co., New York, has been appointed to represent **Jones & Laughlin Steel Corp.'s Container Division** in the sale of its galvanized ware. Palmer Supplies Co., Cincinnati, will represent the division in the sale of steel drums and shipping pails.

Wheeler Associates Inc., Cleveland, appointed Comdr. Monroe H. Shoemaker (USNR) as its eastern representative with offices in Washington.

You get more
than quality
when you specify
Jessop
high-speed steel
When you need a special steel that cuts fast and deep and stays sharp even when very hot, it's pretty certain you'll ask for "high-speed." And if you're looking for assurance of top quality, you are apt to name by name a company that pioneered in the business of making high-speed steels, contributed materially to their development, and has lab and quality-control techniques well ahead of the field. You're apt to specify Jessop.
But you get more than quality when you specify Jessop high-speed steel. You get good service for two very good reasons. First, Jessop has the capacity to supply demand promptly. It can produce more high-speed products, (namely sheets, plates, bars, forgings, castings and special shapes), at one location than any other company in America. And second, Jessop wants all the high-speed steel business it can get and bends over backwards to please its customers. Send in an order and you'll find out.
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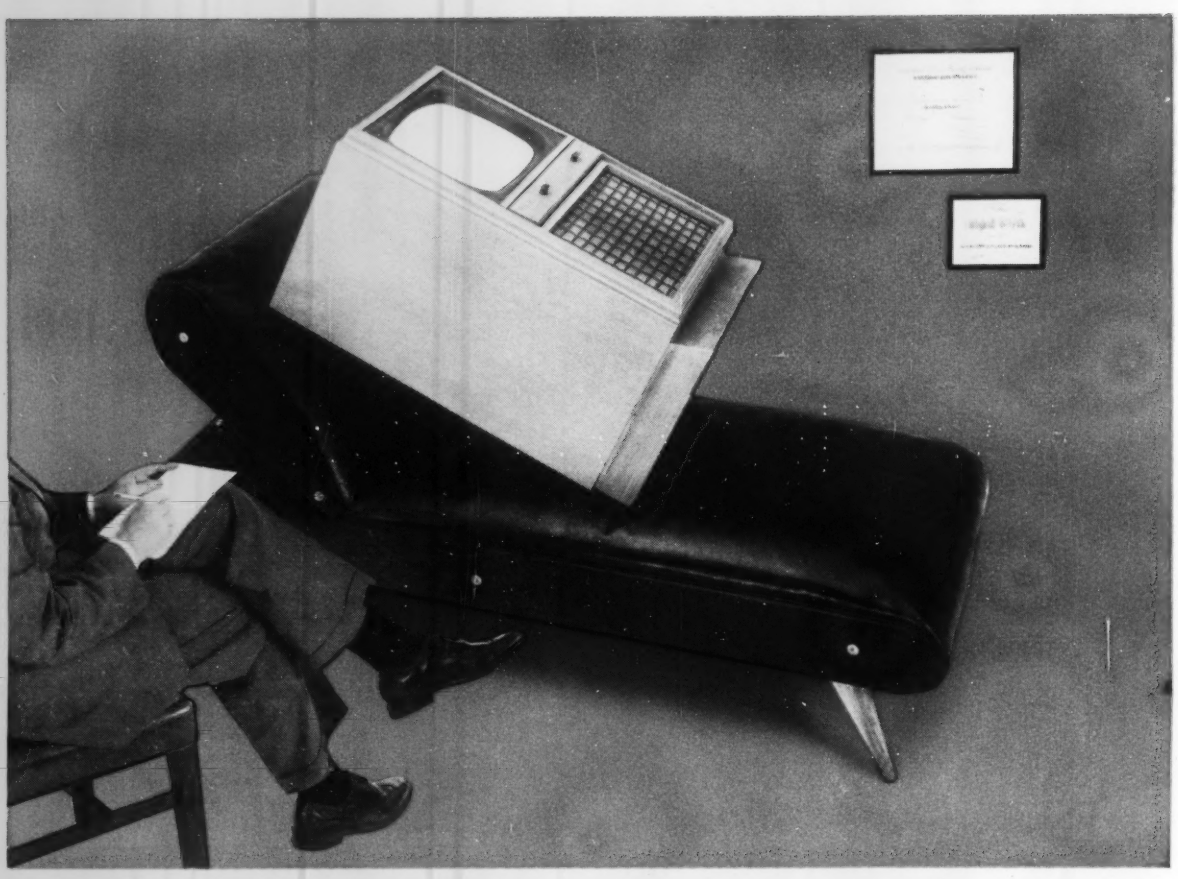

What the TV Set told the analyst

Everything came out . . . its very soul was bared.

On a bench in our Fastening Analysis Lab, engineers took the TV set completely apart . . . at the manufacturer's request. They noted every spot where Tinnerman SPEED NUT® Brand Fasteners could replace ordinary fasteners, to the manufacturer's advantage . . . in cost, assembly time and improved product.

Their "psychoanalysis" of his product went to the manufacturer as a book of sketches, cost data, and production recommendations that helped him fasten his set together better, faster, at lower cost. This book will serve as a design manual for future models, too.

Whether you make television sets or hand-powered juice squeezers, some of the 8000 different Tinnerman SPEED NUT Brand Fasteners belong on your product, to your advantage.

Your Tinnerman representative can schedule a couch-session for your product with our analysts. Contact him for complete information. Meanwhile, write for a copy of Bulletin 336, to learn more about this *FREE* engineering service.

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STEEL

July 8, 1957

Technical Outlook

COMPUTER DESIGNS FURNACE— Analysis of wave forms and current distribution led to changes in electric furnaces at the Niagara Falls, N.Y., plant of Electro Metallurgical Co., a division of Union Carbide Corp. Besides design, the firm uses its Burroughs Datatron for programming, production scheduling, crystal analysis and the storage of library information.

STRIPPER— A dry acid replacement salt (M-629, MacDermid Inc., Waterbury, Conn.) removes 0.00002 in. chrome plate in 30 seconds, leaves the nickel underplate bright, lustrous and free of smut or oxide discoloration. The maker says replates show no whiteness or streaks; plating extends up to ¼-in. farther into recesses.

ALUMINUM JACKET—Here's a new approach to insulating outdoor steam lines: Esso's Bayway, N. J., refinery covered 5½-miles of 30-in. steel pipe with mineral wool and sheathed it in Alcoa 3003. It expects to save more than $500,000 a year in fuel.

HIGH TEMPERATURE IMPROVEMENT— Small amounts of boron and zirconium increase the high temperature properties of 55Ni-20Cr-15Co-4Mo-3Ti-3Al, say researchers at the University of Michigan. Comparisons of reactions between melts in crucibles of magnesia, zirconia and alumina revealed the relationship.

BORON AGAIN—It improves the hot workability of stainless steels, says Armco Steel Corp., Middletown, O. As little as 0.0001 to 0.008 per cent seems to alter the fracture mechanism at high temperatures. The usual intergranular ruptures are inhibited—failures are mostly across the grain, accompanied by a large improvement in ductility. Boron doesn't affect ingot structure, grain size or nonmetallic content, except that normal inclusions are more malleable.

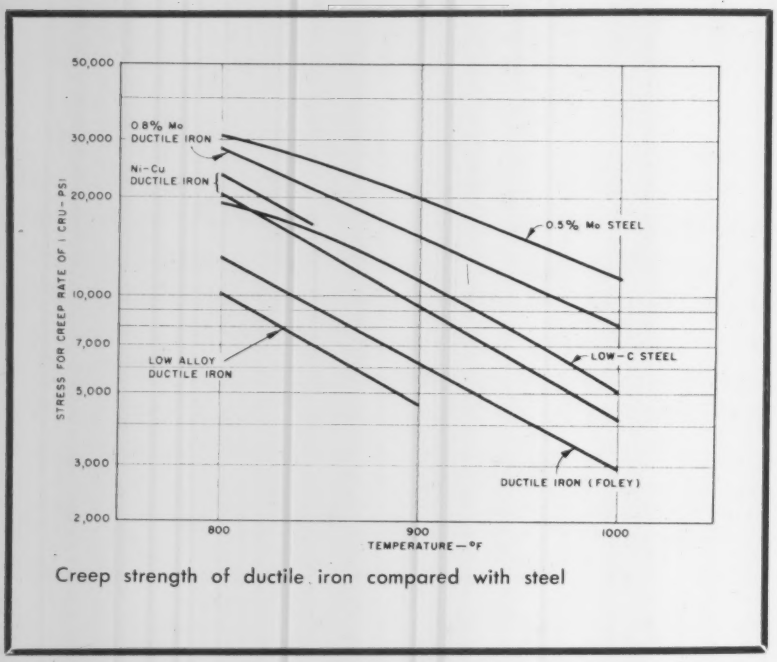
AUTOMATIC DISASSEMBLY— Automation may prove the answer to the aircraft maintenance man's prayer. Everett W. Denison of GE's Aircraft Gas Turbine Division says his company already has worked out automatic techniques that can be used to take apart airplane engines.

UNIVERSAL SKID— Tumpane Co. of Macon, Ga., makes a skid with extruded aluminum members that's used to ship or move machinery. Accommodating a wide range of base shapes, it can be assembled in about an hour and is easily knocked down for storage.

WHAT'S NEW IN ULTRASONICS?— Several advances were revealed by Gulton Industries Inc., Metuchen, N.J., at a Cleveland seminar sponsored by the Industrial Education Institute:

- Ultrasonic equipment mounted outside containers, tanks or pipes measures rate of flow, liquid level or viscosity. No vanes, propellers, restrictors, floats or venturis are necessary. Accuracy is within 1 per cent.
- The process helps nickel plating: Removal of gas from parts being plated is speeded up; increased current densities can be used; adherence is improved because parts are more thoroughly cleaned; and grains in the deposit are much finer than usual.
- The process makes pickling baths work up to five times faster.
- Experiments with ultrasonics by a major eastern steel firm indicate that heatless tempering of steel may not be far off.

Metalworking Outlook—p. 47 Market Outlook—p. 127



Creep strength of ductile iron compared with steel

More Hot Strength for Ductile Iron

Properties are controlled mainly by the condition of the matrix. This means the material's strength can be influenced considerably by alloy additions

RESULTS of research on ductile iron by International Nickel Co. point the way to better high temperature properties. R. D. Schelleng of the company's Bayonne, N. J., laboratory reported these findings (J. T. Eash was co-author of the report) at the ASTM's annual meeting:

- Creep resistance is improved by additions of molybdenum and copper. Phosphorus (not over 0.1 per cent) is also beneficial. Creep properties are similar to those for low carbon steels.
- A composition was developed which has outstanding creep resistance in the annealed condition at 800°F. It is: Total carbon 3.4 per cent, Si 2.4, Mn 0.8, P 0.09, Ni 1.0, Cu 0.60, Mg 0.08.
- Creep resistance of austenitic ductile irons containing 20 to 35 per cent nickel and 2 to 3 per cent chromium is greatly superior to that of the ferritic types. Molybdenum is also beneficial. Creep properties are similar to those of cast 18-8 chromium nickel steels.

Heat Effect — The researchers also reported that long time heating of austenitic irons at 1000 to 1200°F causes a finely dispersed carbide to precipitate which gives a form of mild strengthening.

Another point: Heat treated nickel-copper ductile irons are subject to mild precipitation hardening which strengthens the alloy when it is exposed to 800°F conditions.

Specifics—Normally, the amount of phosphorus in ductile iron is minimized because it decreases the toughness of the material. But when it is present at the 0.05 to 0.09 per cent level, ductility is not impaired excessively, and the tensile strength is higher than that of irons essentially free of phosphorus.

Mr. Schelleng said their studies showed that a significant improvement in creep resistance at 800°F is secured if phosphorus is maintained at about 0.09 per cent.

Molybdenum — Tests were made on two compositions made of low phosphorus base irons containing 1 per cent nickel with 0.24 molybdenum in one and 0.81 per cent molybdenum in the other.

At 800°F, the 0.8 per cent molybdenum iron in the annealed condition showed a minimum creep rate of 0.01 cru (1 cru is one creep rate unit equal to 0.0001 per cent creep per hour) under a stress of 22,000 psi and 1 cru rate at 28,500 psi.

A third stage creep started after about 1600 hours with a stress of 25,000 psi, which indicates that the safe working load is somewhat less where stable long time service is required. At 1000°F, a minimum creep rate of 1 cru was produced at a stress of 8000 psi.

Although the iron containing 0.24 per cent molybdenum was less resistant to creep than the 0.8 per cent molybdenum composition, its creep strength is twice that of regular low alloy samples.

Copper — Ductile iron samples containing about 1.1 per cent nickel, 0.6 copper and 0.085 phosphorus were studied. In the annealed condition, the material showed a minimum creep rate of 1 cru at 800°F when stressed at 20,500 psi. This is 2½ times better than the low alloyed irons and approaches the strength of 0.8 per cent molybdenum composition. The cost of the nickel-copper iron would be lower than that of the nickel-molybdenum alloy.

An old forming method is up to new tricks.

It's busy making blades for jet engines,

but don't overlook its other abilities

production ideas
NO. 12 OF A SERIES

Rolls Forge Precision Parts

YOU ARE GOING to hear a lot about roll forging. This process for close tolerance forming between rolls has a whole new life ahead of it. Watch it begin to figure strongly in the manufacture of high strength appliance and automotive parts.

Right now, most of the roll forging effort is going into the making of better aircraft parts, but this is an old process. Forge shop men will tell you they've used it for years to produce tapers and to block stock for conventional die forging.

It's old in the cutlery industry, too. Long ago, cutlery makers developed a method called "grade rolling" to taper knife blades.

Reborn—But nobody (with the exception of the cutlery makers) paid much attention to roll forging as a precision forming method until the jet engine program came along. About five years ago, word began to get around: Rolling was going to be the answer to all the problems that were plaguing the jet engine blade program—surface finish, root strength, grain structure, complicated shape and rapid work hardening.

A rash of variations on the roll forging theme (see below) was the result. In general, they have shown that:

1. Roll forging has distinct advantages—ability to handle tapered shapes, long die life, exceptionally close tolerances, superior surface finish, low trim waste and adaptability to long runs.

2. It is still a useful extension and supplement of pressure and impact forging.

3. It is capable of great refinement (higher tolerances, greater pressures, difficult contours), and what has been accomplished with it has led to improvements in conventional forging.

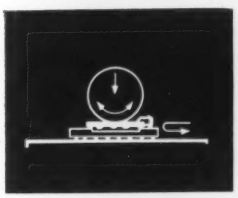
4. It lacks versatility at present, but that should come with development of sturdier equipment, improved die design and experience on jobs that are rollable but haven't been tried.

5. It has all the earmarks of a process adaptable to automation.

6. It isn't forging in the usual sense, but it isn't straight rolling either. Some of the techniques employ a heavy initial squeeze (like pressure forging), followed by considerable extrusion. Some forge hot and some cold. Everyone has his own name for it, but "roll forging" seems to be the most common one.

7. It isn't the last answer in the making of jet engine blading, but

A. O. SMITH



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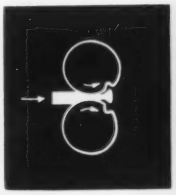

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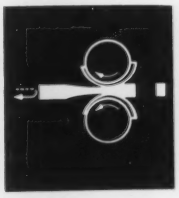

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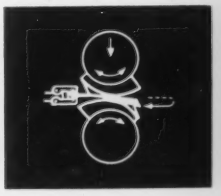
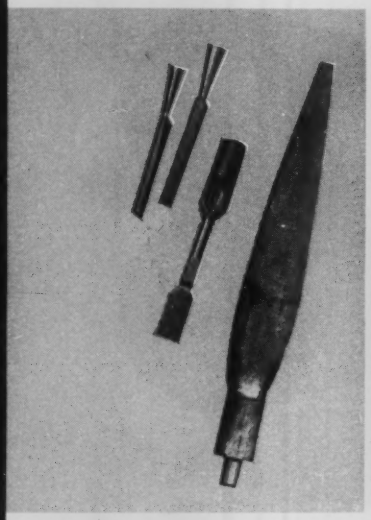


KELSEY-HAYES

DELCO-REMY



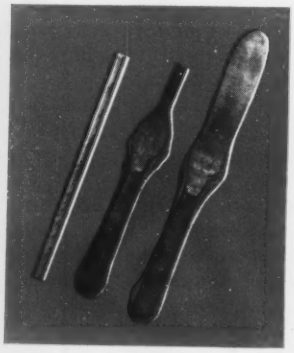
Bread and Butter Side of Roll Forging

For many a company, roll forging means an Ajax Mfg. Co. (Cleveland) forging roll machine. Widely used for stock preparation for press and hammer die forging, the rolls are also capable of hot rolling semifinished parts, as the illustrations show.

Grade Rolling, the Cutlery Side of the Picture

Knife blades are often formed by grade rolling at International Silver Co.'s Cutlery Division, Meriden, Conn. The work is done by dies (roll block inserts) fixed to the rolls, which revolve at about 70 rpm. As the rolls turn, a gap appears between them each time the dies disengage. The blade blank is fed through this gap and back rolled toward the operator.

The dies are ground so that the blade is tapered both lengthways and crossways. Handles of the hardenable stainless steel knives pictured, right, are hammer forged, blades are hot rolled.



results are good enough to create plenty of enthusiasm.

Forging Rolls — The principal maker of big forging rolls is Ajax Mfg. Co., Cleveland. Ajax was producing a line of forging roll machinery when grandfather drove a wagon, and the wagon brake pedal was formed on this type equipment.

The machine is basically a stand with two rolls on which semicylindrical dies are mounted. The dies mate during only a portion of each revolution. During the other portion, the operator can pass the work between the rolls against a stop. As the dies repeat the revolution, they meet the stock and roll it toward the operator.

Dies—Work is ordinarily done hot, but because dies encounter the work only for a brief period and have ample opportunity to cool, die wear is slight. Rules governing the design of die grooving and die materials correspond fairly closely to rolling mill practice.

As a rule, die circumference should be great enough to work the entire length of the forging in one pass. (Ajax dies usually have multiple passes cut into them.) Some of the Ajax machines will take full circumference dies on outboard spindles, permitting them to handle longer work.

Products made on an Ajax machine usually taper from the gripping end out. Shovels, tapered springs, garden fork tines, crowbars, knife blades, automobile axle shafts and shift levers have been made on these machines. They are also used for blocking or fullering blanks for die forgings.

Grade Rolling — Cutlery makers do both cold and hot roll forging. Their grade rolling mills work high carbon and stainless steel to produce knife blades with base to point and back to edge tapers.

A popular mill for this type work uses segmental dies bolted to rolls. Its key features are: 1. A bending device for offsetting the knife blade stock so that the back of the blade lies in line with the handle while the tapered edge extends beyond it. 2. A mechanism operated by a cam track cut in one roll which moves the stock in and out of the dies.

Pocket Rolls—A small, 2-high mill for grade rolling is made by Fenn Mfg. Co., Newington, Conn. It's hand fed, with antibacklash provisions to prevent roll slippage. The die cavity is cut into cylindrical rolls. An upset knob on the end of the blank fits into a deep pocket in the die and serves to orient and pull the workpiece through the rolls.

The Fenn mill is a small machine: It has been used for rolling some of the smaller compressor blades for jet engines, but deforming the big blades has required pressures far beyond its abilities.

Beef Needed—The evolution of roll forging machinery has been in the direction of massive roll stands and extreme rigidity. Some of the huskier machines exert rolling pressures in the neighborhood of 750 tons per square inch. It takes plenty of beef to maintain the required tolerances in the finished product.

Insufficient strength and rigid-

ity appear to have been the nemesis of a hot rolling machine for engine blades developed by Wallace Aviation Co., Wallingford, Conn. The machine was acquired by Clevite Corp., Cleveland, and eventually passed along to Utica Drop Forge & Tool Division (Utica, N. Y.) of Kelsey-Hayes Co.

Utica Drop Forge has gone way beyond it now. The division is doing hot blade rolling in massive gap-roll stands of its own design. It is cold rolling smaller blades in die-sets mounted in small punch presses, a process developed by Delco-Remy (General Motors Corp.) and improved by Utica Drop Forge. The die set is a frame enclosing opposing segment rolls. A linkage to the press ram actuates them.

Contour Rolling—The Aeronautical Division of A. O. Smith Corp., Milwaukee, has a process unlike any of the others. Rolling is done on a machine which looks like an overgrown printers' proofpress. The workpiece moves on a flat platen under a pressure roll. Dies are set either in the platen or the roll.

One of the interesting uses that A. O. Smith has made of its contour rolling machine is the rolling of sections for aircraft weldments. Such sections, often with thick edges and thinned and tapered webs, have gone into large numbers of aircraft propellers and bulkheads.

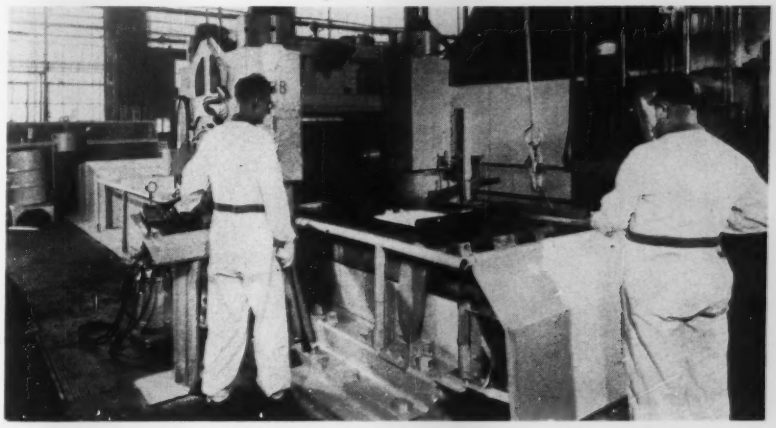
The company has also roll-forged heavily ribbed steel sections (they look like aluminum extrusions), waffle sections (two fused together face to face make a husky honeycomb) and integrally stiffened panels that look like safety floor plates with exaggerated protrusions.

"Roll-Form"—Eaton Mfg. Co.'s Aircraft Division in Battle Creek, Mich. has a compressor blade rolling line which goes by the name "Roll-Form." It is also referred to as "knuckle rolling." Eaton is reluctant to say much about it, but others doing similar work look to the Eaton operation as the most successful adaptation of roll forging thus far. Eaton builds its own Roll-Form equipment and has licensed Ex-Cell-O Corp., Detroit, to use it.

The Aircraft Engine Division of Ford Motor Co. in Chicago has been working for some time on a blade rolling die set contained in a large Lake Erie press. Although overly complicated, the Ford design has the advantage of being adaptable to standard presses and of being able to apply extreme pressure.

To make the curved dies which impart both the airfoil cross section and twist to titanium compressor blades, Ford has developed a fixture for a Keller machine which translates the proper curvature to the die from a flat master.

Opinion — The Jet Division of Thompson Products Inc., Cleveland, has five roll forging machines of various types doing research and production work on blade rolling. J. L. Lazar, manager, Structures & Processes Development Department, Jet Division, feels that although rolling has its place in the engine blade manufacturing

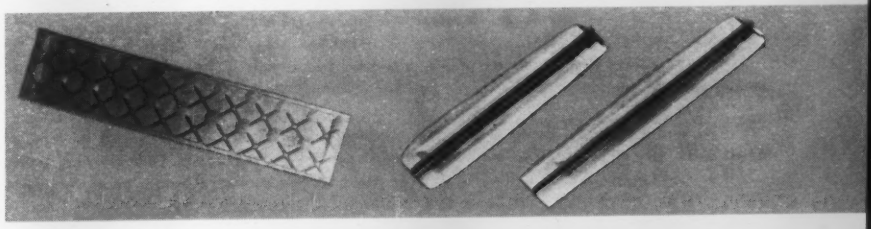


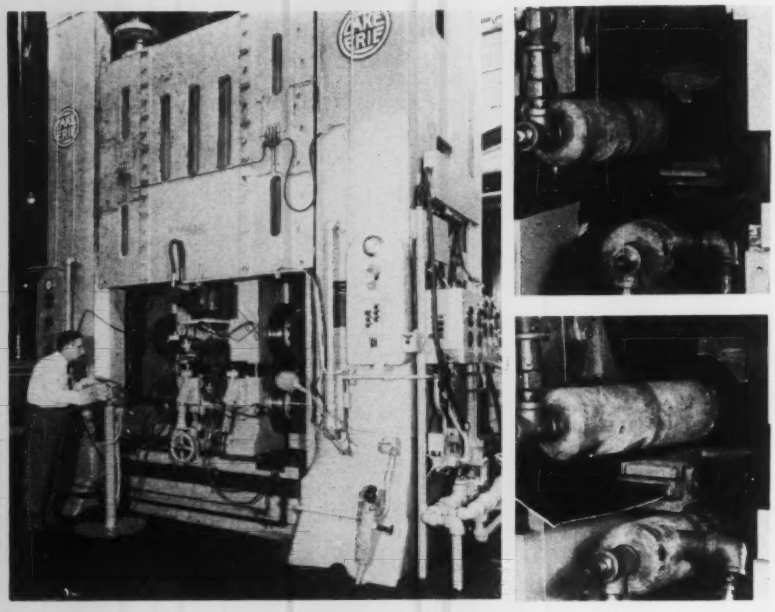
Rolling Pin Technique for Roll Forging

Contour rolling at A. O. Smith Corp.'s Aeronautical Division, Milwaukee, is done on the 1800-ton machine illustrated above. The roll is mounted in a movable head to allow vertical adjustment. It is not powered, but a powered platen reciprocates on a horizontal table under the roll. The dies may be mounted either on the platen or on the roll or on both—the first is the usual case. The roll forces the hot workpiece (which is clamped on the platen) into the configurations of the die.

Die configurations may be symmetrical or asymmetrical. The die pattern may include deep cavities and bosses at any angle to the roll. Landing gear parts, bulkheads, turbine blades, jet engine rings and shrouds and titanium propeller blanks have been rolled on this machine. In one experimental setup, a number of small turbine blades were rolled from a single workpiece and later blanked out. Some typical jobs are shown below.

Surface finish is between 63 and 125 microinches, thickness tolerances, ±0.010 and ±0.015 in. One of the most important features of the process is that it distributes metal where it is needed for a desirable strength-weight ratio.





Press Die Set Approach to Roll Forging

At the Aircraft Engine Division of Ford Motor Co., Chicago, the approach to roll forging is a massive die set that can be adapted to available heavy press facilities in an emergency. The pilot model is mounted in a 1500-ton Lake Erie press and is being used for rolling the airfoil of titanium compressor blades for jet engines.

A blank is heated and upset to form the blade root section. It is then inserted in a feed arm and induction heated to about 1400°F. The dies are heated to about 1000°F.

Holding the blank by the root, the feed arm passes it between the rolls, which descend under the force of the press ram, squeezing the blank between roll-mounted die segments. As pressure builds up, hydraulically powered racks engage pinions on the rolls, causing them to rotate and roll the blank back between the die segments.

Several passes may be made in the same die by varying the roll closure. In the small photographs, a blade is visible before and after rolling. The cylinders are die heaters.

The Ford machine is capable of rolling stainless or titanium blades about 10 in. long by 4 in. wide. Val Kopacz, manager of the semiproduction department at Ford Aircraft, points out that roll forging now can do the work in three to five passes. Ultimate goal: One pass.

scheme, still it's far from the last answer. "Our research on roll forging has led to developments in conventional forging that were not even considered two years ago," he says.

But Thompson is still developing the process. Loewy-Hydropress is building a roll forging machine for Thompson which will lengthen the starting billet as much as 4 times (50 per cent elongation is typical of present roll forging equipment).

More Opinion—It will probably be used on titanium at first for rolling "large tapered and ribbed sections." While this doesn't mean that the machine won't roll engine blades, it does sound like the sort of activity which will make a future for roll forging beyond blade rolling.

Mr. Lazar's somewhat tempered enthusiasm is countered by Stanley D. Staken, superintendent of rolling, Utica Drop Forge. He's all for roll forging. "We think it has tremendous possibilities for growth. Don't sell it short. We've only scratched the surface with blade rolling. Automotive parts, missile parts, and tools are definite possibilities to be made this way," he says.

Output — Certainly, roll forging is adapted to mass production. Some of the hand fed cold rolling machines at Utica are handling 500 parts an hour. Another company with its eyes on the mass production possibilities is Verson Allsteel Press Co., Chicago.

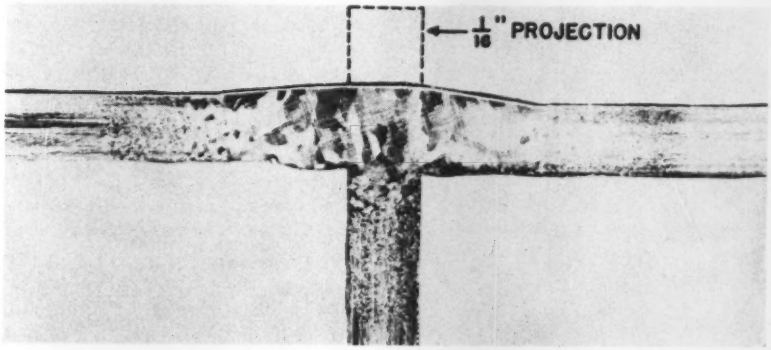
Starting with a machine of European design, Verson is developing a forging tool that will take a rough forged blank for a jet engine blade and cold roll it to finished size and contour in one pass. Production should be about ten parts per minute. The rolling machine is planned to be machine fed so that it can become part of an automated line.

Guideposts—In spite of all the activity, there's little information on designing for roll forging. Typical comments are: "Every job's a unique problem." "It's 50 per cent art."

Generally, a part that can be economically roll forged on precision equipment will fit these qualifications:

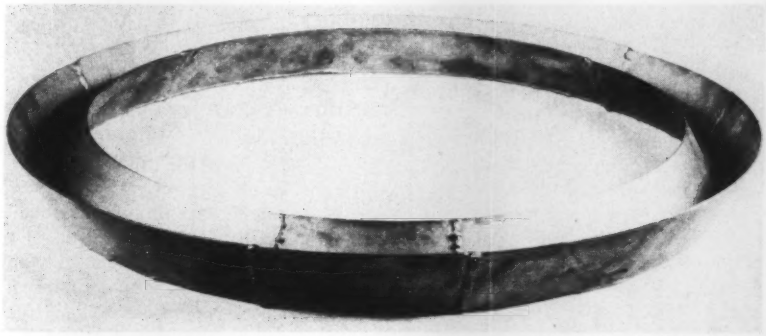
1. It will be costly and wasteful to make by machining or conventional die forging.
2. It will benefit from controlled elongated grain structure.
3. It will be tapered and have an end that will provide a gripping surface.
4. It will be between 2 and 24 in. long (a function of die size) and will be considerably longer than it is wide.
5. It will require an as-forged finish (12-16 rms) that will meet finished surface requirements with little cleanup.
6. It will have to meet as-forged tolerances as close as ±0.0015.
7. It will have some characteristic such as double taper, a twist, deep ribs or extreme physical requirements that will defeat other production methods.
8. It will be a long run product, especially if of complex shape.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



Wright Aeronautical Division, Curtiss-Wright Corp.

This gutter strap weld was made from three pieces of arc-cast molybdenum. Note complete penetration



Wright Aeronautical Division, Curtiss-Wright Corp.

Segments for this 20-in. flame gutter were joined by helium shielded welding at the apex joints; buttwelds connected them into continuous ring. Assembly was maintained at 400°F

How To Weld Molybdenum

The metal is exceptionally strong in the 2000°F area, but it oxidizes rapidly at welding temperatures. Technique described in this article gets around that problem

By R. R. FREEMAN
Manager, Arc-Cast Molybdenum Development
J. Z. BRIGGS
Director of Technical Information
Climax Molybdenum Co.
New York

THE last major obstacle to the commercial use of molybdenum welding (brittleness) has been licked.

Three firms played big roles in the development: Curtiss-Wright Corp., Caldwell, N.J.; Marquardt Aircraft Co., Van Nuys, Calif.; and Westinghouse Electric Corp., Pittsburgh.

You can make welds which are moderately ductile at room temperature by following their recommendations:

1. Use arc-cast molybdenum. Sintered molybdenum creates problems such as porosity and cracking.

2. Use a controlled atmosphere of argon, helium or hydrogen to protect the weld puddle. Be careful of commercial gases—special purification processing is required to remove objectionable amounts of oxygen.

3. If the weld will be subject to a moderate amount of forming, it may be wise to recrystallize and hot form. The practice avoids uneven response of weld and parent metal to the forming. Recrystallization reduces room and high temperature strength if the cross section is not reduced at least 50 per cent.

4. If you're thinking of methods other than arc, remember that molybdenum's high melting point, strength and heat conductivity raise problems, particularly for the resistance methods.

Electrolytic polishing of faying surfaces is recommended. It probably eliminates surface layers that become contaminated during processing.

Procedures—You can weld molybdenum to molybdenum by arc, electrical resistance, percussion and flash methods. And you can weld it to metals with which it alloys.

Atomic hydrogen or inert gas shielded arc (Tig) produce the most satisfactory welds. Filler wire is optional. Manual welding is all right but not as reliable as the automatics.

The best shielding gas appears to be helium because it produces more heat at the arc. You won't need a shielding box if you can protect the weld without one.

Points—Two steps are essential in minimizing embrittlement: Cleanliness and the elimination of oxygen and nitrogen from the welding atmosphere.

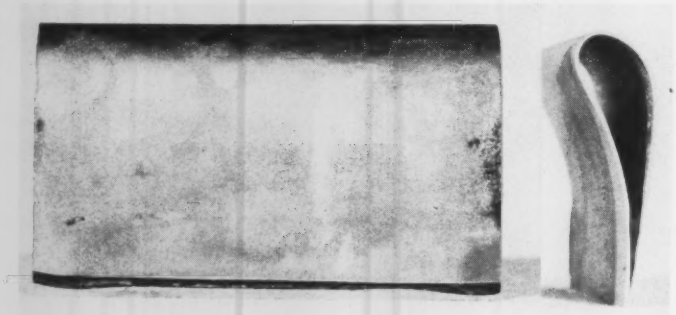
Electrolytic polishing is the most reliable cleaning method, although etching in a sulphuric-chromic acid solution is good.

It's best to use purified gases. Some work has shown that the upper limit is 0.005 per cent for oxygen, 0.1 for nitrogen.

A preheat at 400°F is desirable for welding a complex assembly.

Corner or edge welds are easier to make than buttwelds, which are easier to make than fillet welds. Use buttwelds for sheets up to 3/32-in.; greater thicknesses require multiple passes in a V-joint.

It's a good idea to use filler wire



Gas turbine guide vane was warm stretch formed from 0.040-in. molybdenum and brazed with a nickel-chrome-boron (AMS 4775) alloy in a hydrogen atmosphere

Rules for Brazing

CONTROLLED atmosphere furnaces, induction heaters or resistance welders are satisfactory. Experienced operators have made successful brazes with an oxyacetylene torch.

If you intend to apply a high temperature protective coating, be sure that the melting point of the brazing metal is above that of the coating.

Copper and silver alloys are satisfactory for all but high temperature service. As little as 0.25 per cent phosphorus in silver alloys greatly improves wetting; 1 per cent is recommended for maximum strength.

These compositions give excellent service:

For electric and electronic parts—Ag 50 per cent, Cu 15.5, Cd 16, Ni 3.

For general use—Au 80 per cent, Cu 20; Au 82.5, Ni 17.5.

Spotweld—Relatively thin sheets can be resistance brazed in a spot or seam welder. No flux is needed, if all parts are well cleaned. Copper alloy electrodes are O.K., but those with a tungsten face are better.

Heavier sections can be brazed without flux in a hydrogen atmosphere furnace. A preliminary nickel or copper coating is useful.

No single brazing alloy works well at high temperatures for all applications although some alloys show promise. A nickel-chrome-boron alloy (AMS 4775) works for services up to 2000°F. Apply it in a hydrogen atmosphere, not in a vacuum. Silver-palladium, palladium-iron, nickel-titanium and columbium-nickel alloys apparently do well in a vacuum but not in a hydrogen atmosphere.

additions for all multiple pass weldments as well as a 400°F preheat.

Precaution—In multiple passes on long weldments, the weld metal frequently oxidizes when it leaves the protective atmosphere. You'll have to clean it before the next pass.

Filler wire lessens the need for highly accurate fitting of details. It also reinforces the weld, a desirable feature if you're planning to form or stretch the parts afterward.

Arc cast molybdenum makes a better filler wire because of its lower gas content.

Settings—Amperage and travel speed depend on the fixtures and chills, so you'll have to establish them by trial. There is some indication that the faster the travel speed, the more ductile the weld. Two provisions must be met: There must be sufficient time for penetration, and the shielding must be good enough to prevent atmospheric contamination.

Stress relief is generally recommended. Be sure to select a time and temperature that will not recrystallize the metal unless you expect to form the part heavily.

You can improve ductility in the weld and heat affected zone by roller leveling and planishing at 600°F. Grinding to remove microcracks is another excellent practice.

Resistance Welding — Nickel or platinum foil is frequently sandwiched between the molybdenum to produce a kind of braze-weld.

You can use either alternating or direct current equipment. Either the condenser discharge or the ½-cycle, timed ignitron is satisfactory.

If possible, dimple or sandblast sheets for projection welding. For spotwelds, it's a good idea to etch the surfaces of both sheets being joined. You can immerse them for 10 seconds in a 195°F solution (5 gallons of concentrated sulphuric acid, 13.2 ounces (Avdp.) chromic acid, 1 quart hydrofluoric and 0.1 quart concentrated nitric). Immerse the sheets in a hot chromic acid, glass cleaning solution until the blue oxide disappears.

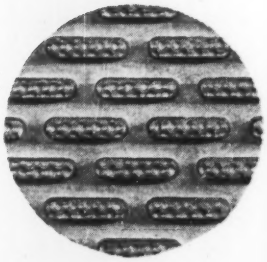
Spot and seam welding have drawbacks: Brittleness of the joint, sticking and deformation of the electrodes. Copper, copper-alloy, molybdenum and tungsten electrodes have been tried. Cooling or refrigerating them might give you some help.

Others — Percussion, flash and pressure welding in dry-hydrogen, oxygen-free atmosphere produce good results. The processes are so rapid that they produce no grain growth. The original strength of the material remains unchanged.

Ultrasonic welding (STEEL, June 4, 1956, p. 101) joins thin sheets satisfactorily, although present equipment limits such joining to small sizes.

Summing Up—Top efficiency of welds is not over 50 per cent of the strength of the basis metal. But the way is now open for structural uses in high temperature service.

US RUBBER **STEEPGRADE**



BIG LIFT GETS A BETTER GRIP

This giant clamp, a hydraulically-operated attachment for lift trucks, can handle almost any kind of load in bales, boxes, bags, cartons or crates. Recently, the makers of the clamp lined its arms with U. S. SteepGrade. Its rugged traction and non-slip grip (even at a capacity of up to 5000 pounds) has proved so superior to previous lining that the clamp manufacturer has now standardized on U. S. SteepGrade!

Of course, SteepGrade's principal job in industry is as a conveyor belt, carrying materials on ascents or descents as steep as 45 degrees. The exclusive "gripper-cleat" construction (see life-sized section above) holds packages and other articles firmly, prevents "avalanches" at critical angles. SteepGrade's ability to work at steep angles saves valuable floor space, conveyor length and belt footage.

U. S. SteepGrade—plus expert engineering service—is available at any of the 28 District Sales Offices, at selected distributors, or contact us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co. Ltd.

US RUBBER **Mechanical Goods Division**

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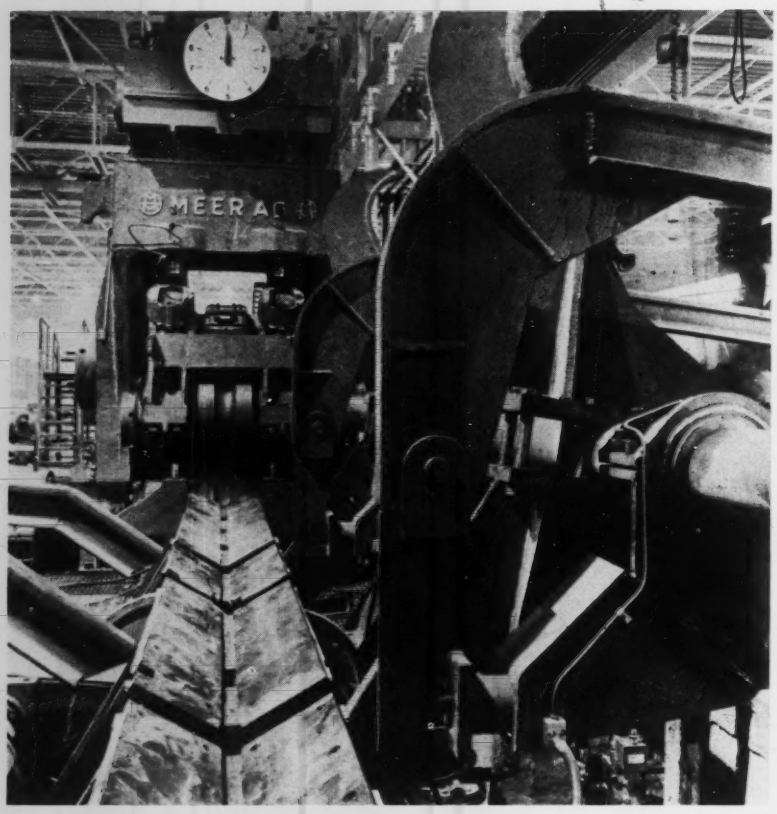


In contrast to conventional multigrooved rolls in a plug mill, the Mannesmann version has single grooved rolls (like that at end of trough). Along with speed, an acceleration feature is built into the rolls

Latest Word in Tube Mills

In the Mannesmann company's new plant, material moves automatically from start to finish at an output rate of one hot-finished tube every 20 seconds

INCREASED speed and power, along with automation, update an old process at a $20-million seamless steel tube plant that just started operating at Sault Ste. Marie, Ont. It's owned by Mannesmann Tube Co. Ltd.

Expected result: Production of one hot-finished seamless tube every 20 seconds—perhaps faster.

Yearly capacity of the new plant is 225,000 tons of seamless, making it the tenth largest producer of this product on the North American continent (see STEEL, June 24, p. 159). Initially, it is making casing and line pipe for the Canadian oil and gas industry.

The Principle—In designing its pushbutton plant, the subsidiary of the German firm—Mannesmann A.G., with headquarters at Dusseldorf—adhered to the principle of the time-honored Mannesmann piercer. But it applied horsepower that's high for the size range of the mill (4.5 through 10.75 in. OD) and boosted the circumferential speed of rolls in the two piercers to 1200 ft a minute. Each piercer is driven by a 4000-hp motor.

Total connected horsepower at the plant exceeds 22,000. Main mill drives, exclusive of auxiliaries, have 14,000 hp.

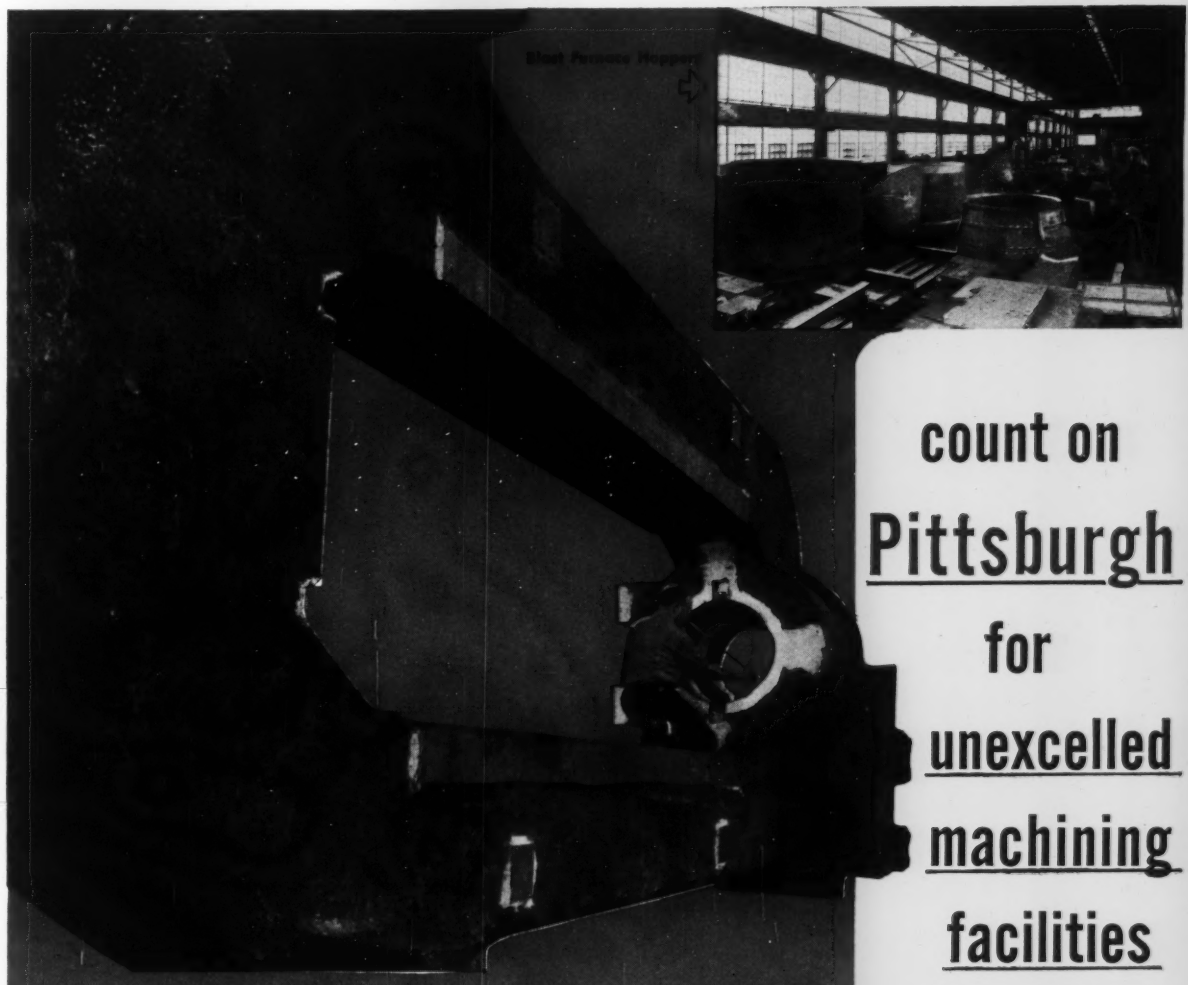
Timesaver—The plug mill is one station where speed is utilized. (It reduces the wall thickness of the hollow bloom and lengthens it after it comes from the second piercer.) Coupled with speed is an acceleration feature. It permits each rolling pass to start with the rolls turning at 70 rpm. Once the tube starts moving, the roll speed moves up to about 160 rpm. hastening the tube's two passes through the mill.

Unique Roll—The rolls are unlike those usually seen in plug mills. Conventional rolls have several grooves, but these have only one groove (see accompanying picture). Each roll in the single, 2-high stand is individually driven by a 2250-hp, dc motor.

It's necessary now for a man to do the "plugging" (putting on and taking off the cast iron plug over which the rough tube passes), but Mannesmann is working on an automatic, mechanical "plugger."

Quick Change-Overs — After tubes leave the plug mill, they go into one of two reelers and then into Mannesmann's version of a sizing machine. (In seven stands, it produces the uniform final dimension and roundness of the pipe.) This C-frame mill with vertically and horizontally mounted rolls is designed for rapid roll change: It has two roll buggies. One is under the rolls in the machine; the other supports another set of rolls sitting alongside the machine. In making roll changes, one buggy is rolled out, and the other is rolled into the machine.

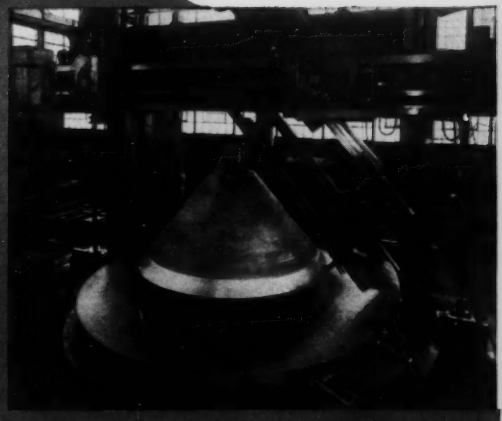
Engineered Safety—The inspection department includes an automatic hydrostatic tester, which can exert as much as 13,000 psi. To protect employees against injury from a pipe bursting under test, the company has equipped the sides of the tester with a steel shield. It is raised to admit a pipe



Blast Furnace Hopper

4 High Mill Housing

Blast Furnace Bell on 20'0" Vertical Boring Mill



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to the tester, then lowered before the test starts. A shatterproof window permits a supervisor to observe. After being hydrotested, pipe moves to a bed that tilts so that water is drained completely and quickly. This eliminates messiness further along the line.

Automation—From start to finish, the material moves automatically. If necessary, men can take over control panels at various points. For instance, a man pushing buttons can operate the charger that feeds tube rounds into the rotary hearth furnace where the rounds are heated to rolling temperature of about 2250°F, or the controls can be set so that charging and discharging are automatic. (The furnace is 80 ft in diameter and has a capacity of 75 tons an hour.)

Some of the automation along the line involves the use of fireeyes. They register heat through mathematically spaced holes. Heat creates the reaction which guides and propels the tube to its next operation. Similar heat created impulses make sure the way is clear by initiating the action in the step ahead.

While the human element plays a more important part in the inspection department, the margin of human error is reduced by electronics. The wall thickness of a tube is x-rayed, and unsatisfactory sections are automatically sprayed with paint. They are cut off and discarded.

They Did It—General engineering and co-ordination of the project was the responsibility of the Mannesmann-Meer Engineering & Construction Co. Inc., Easton, Pa. It also engineered the hot mill machinery and most of the handling and conveying equipment. The hot mill machinery was built by the Easton firm's parent, Mannesmann-Meer A.G., Munchen-Gladbach, West Germany.

Most of the equipment in the finishing end of the plant was supplied by Canadian and U.S. firms.

Canada Making 'Big Inch' Pipe

An 800-ton forming press is the center of this welding process that uses cold expansion for final forming. The mill can make up to 3 miles a day of 20 to 36 in. OD pipe

OIL and gas producers in Canada now have a mill that produces pipes up to 3 ft in diameter. The $10-million plant, built by Welland Tubes Ltd., Welland, Ont., is capable of producing 200,000 to 300,000 tons of pipe (20 to 36 in. OD) annually. The process: Electric fusion welding.

First Step—Flat pieces of 40 ft long steel skelp are pickled in sulphuric acid, water and soda to remove all traces of grease, mill scale and dirt.

They are sheared to the exact width, beveled on the edges and given an initial bending. The skelp rolls onto a press where it is formed into a "U" shape by a downward plunging bulb and converging side beams.

Finish Forming—After lubrication to prevent galling, the "U" shaped skelp is positioned in a semicylindrical die on the main forming press. Three, 5300-ton capacity dies force the upper die down to form the pipe, with the edges perfectly aligned for welding.

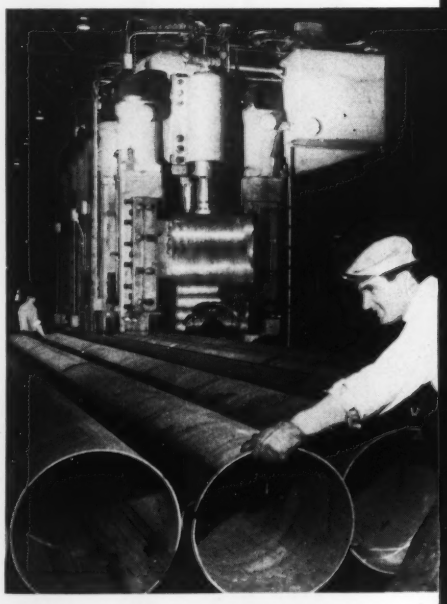
The edges of this cylinder are tackwelded; any offset at the ends of the pipe is removed, and the tackwelds are ground flush.

Cleaning—The pipe is degreased by immersion in a hot water detergent, and a 4-in. tab is welded at each end of the pipe seam to assure proper lead-in and cutoff of finish welds.

Welding — The pipe is fusion welded on the inside and outside. A traveling boom, positioned by a small wheel riding in the beveled seam, moves inside the pipe. The outside weld is applied by a stationary welding fixture. The pipe moves on rollers past twin arcs while an operator maintains accurate seam position.

Before entering the expander, a preliminary inspection is made; welding tabs are removed; end welds are dressed, and loose scale and flux are removed.

Final Forming—In the expander, restraining dies surround the pipe while water is pumped in. The pressure cold works the metal to its final accurate diameter.



Three hydraulic rams work together to form the finished cylindrical shape of the pipe. Edges are aligned for welding at the next station

To test the pipe, pressure is removed and the restraining dies opened. Then the pressure is built up again. The pipe receives a vibration test (20 automatic hammers are used), and the weld is visually inspected before the pressure is released.

Final steps include testing for accurate diameter, measuring wall thickness and inspection of the inside and outside surface and welds.

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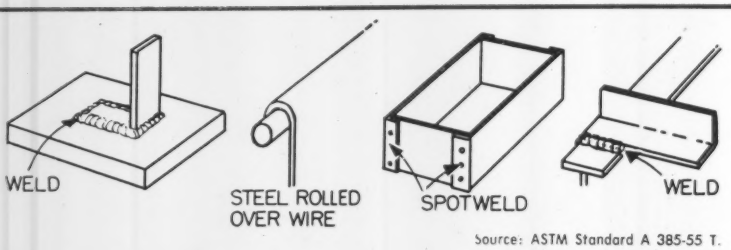
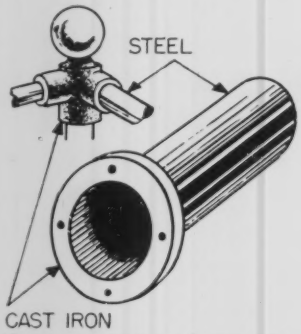
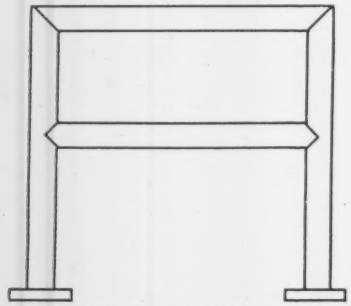
must be completely sealed by welds, or be absolutely free from oil, grease and arc welding residue



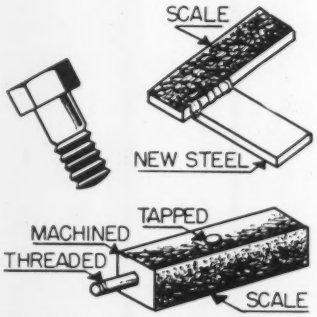
Source: ASTM Standard A 385-55 T.



If you want a uniform appearance, it's best to sandblast combinations like these . . .



For safety's sake, be sure to use open miter joints and steel floor flanges in pipe rails . . .



It's best to blast clean budget killers like these before machining to avoid damaging surfaces

By E. R. HAUSER
President
Metalplate Co.
Birmingham

How To Cut Galvanizing Costs

Excessive amounts can often be traced to incorrect design and incomplete knowledge about fabricating practices which affect the process. Here are the main rules to follow

THE performance of a galvanizer depends almost entirely on the kind of parts his supplier sends him.

Quality and cost are determined by fabrication, design, material and surface conditions. All are controlled by the fabricator.

Here are some suggestions and practices which can improve your galvanizing quality.

Cleanliness — Welds should be thoroughly cleaned. Use blasting, grinding or brushing, although we prefer blasting for the removal of weld flux which is chemically inert. Many fabricators use a bare, uncoated welding rod to avoid the cleaning problem.

Joining old and new material in an assembly to be galvanized creates a serious pickling problem. The acid attacks each metal at a different rate. Steel with normal mill scale and light rust is attacked more rapidly than steel with heavy scale and rust.

Cast iron, malleable iron and cast steel should not be joined to rolled steel for the same reason. A thorough blasting following fabrication helps assemblies made of old material and castings.

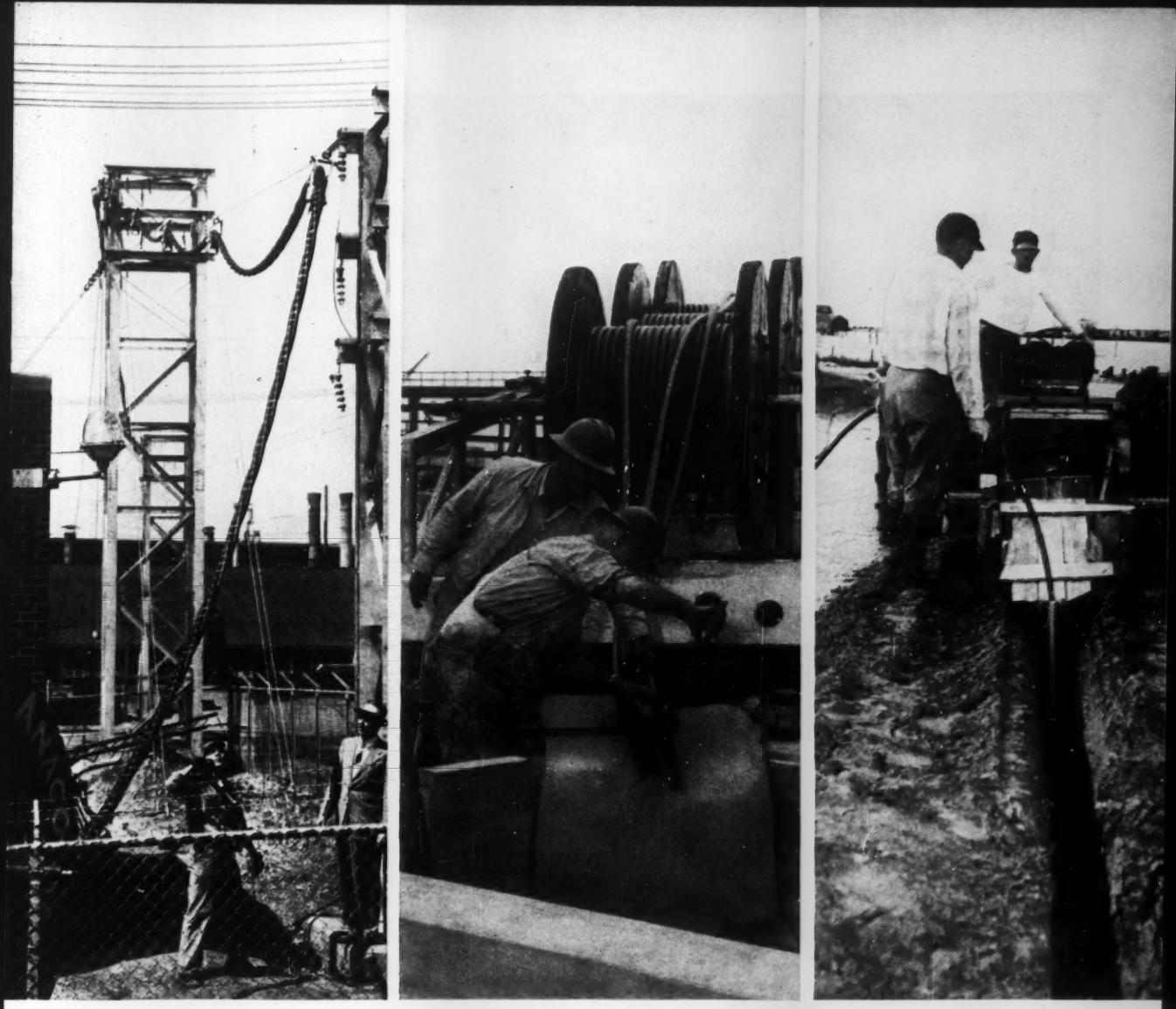
No Pockets — Designers should consider drainage and avoid pockets and bends which trap molten zinc. You don't have enough time to manipulate the work to get rid of surplus metal because zinc cools too rapidly.

Ample sized openings should be provided in closed tanks — the larger the better. Such vessels must be filled with pickling and cleaning solutions and emptied several times prior to galvanizing, and the cost of handling is determined by the size of the openings. To prevent bare spots, side openings must be provided for gas from pickling to escape. Make sure that all openings inside the tank are flush.

Avoid closed or blind sections, particularly in fabricated pipe railings. They can cause an explosion when the piece is submerged in molten zinc. Operators who disregarded proper venting have been seriously burned, even killed. Full openings are best.

Metallurgy — To prevent embrittlement during galvanizing, all malleable castings should be heated to 1200 to 1500°F and water quenched. The holding time and the temperature of the quench water are not important.

You usually have to retap oversize all U.S. standard threads ¼-in. in diameter and larger where galvanized nuts and tapped holes are to accommodate galvanized male threads. Better co-ordination could avoid some of that. Also remember that it's better to sandblast before machining.



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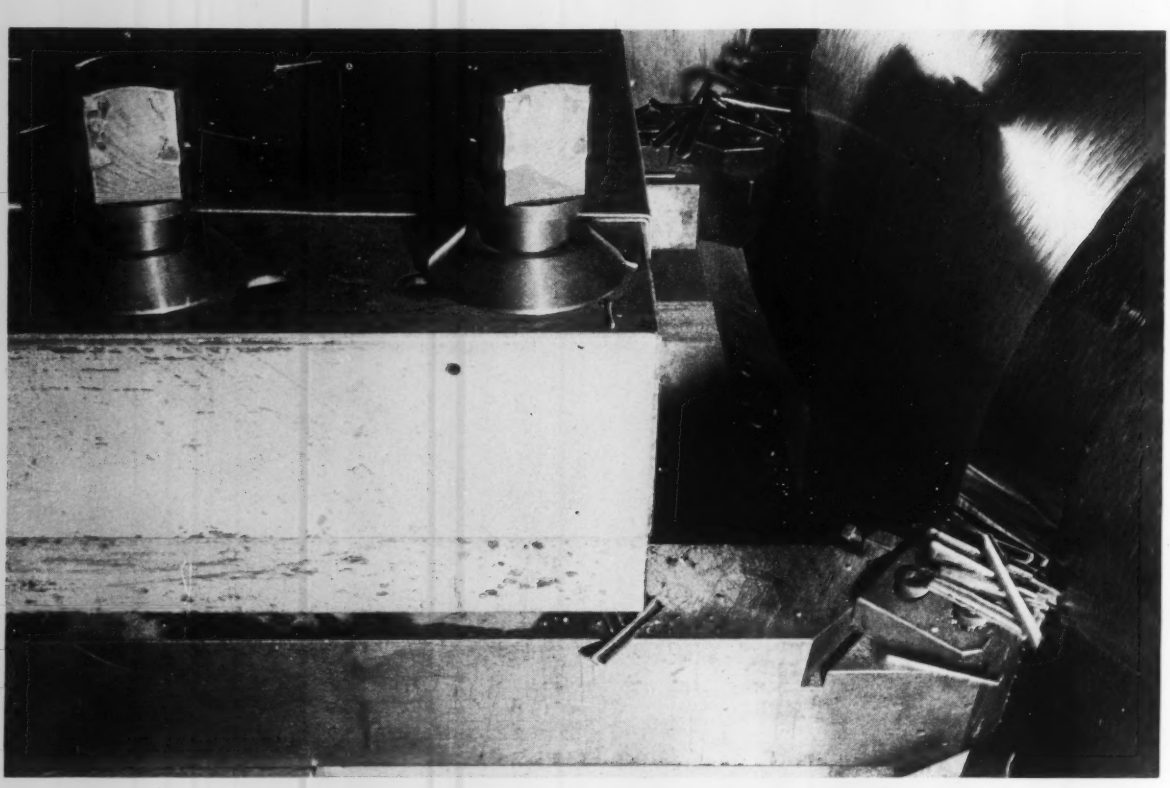


Guide to Carbide Tool Geometry

Such factors as tool life, speed, feed and finish depend on the cutting angle. Starting angles that can be varied to suit your need are listed for various materials

IN 40 per cent of premature carbide tool failures the reason is improper tool geometry.

If the cause is bad grinding practice, the solution is easy. But, sometimes, it's caused by improper tool engineering, says R. J. Moessner, who heads up the Carboloy training school for carbide customers at General Electric's Metallurgical Products Department, Detroit.

Knowing the proper cutting angles of a tool can save a lot of problems. Angles listed in the table on page 111 are suggested starts; they should be varied to meet your needs.

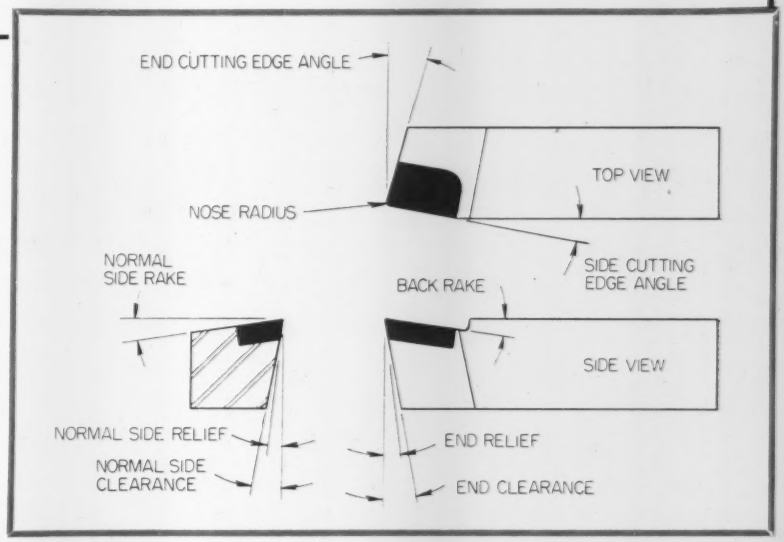
Rake—Back rake ranges from negative 40 to positive 10 degrees; negative angles greater than 7 degrees often are combined with positive side rake and a side cutting edge angle. These angles may be combined to give a positive true rake often used when machining austenitic steels. The results are free chip flow, strong shock resistant cutting edge and a tendency to reduce work hardening.

Side rake ranges from negative 7 to positive 15 degrees. A positive rake produces a freer cutting tool, but reduces the included edge angle. Negative rake increases cutting forces but makes a more shock resistant tool.

Disposables — Users of throwaway carbides prefer negative rakes so tools can be indexed on both sides, giving cheaper tool cost

Tool Signatures for Carbides

MATERIAL	RECOMMENDED ANGLES						
	Back rake	Side rake	End relief	Side relief	End cutting edge angle	Side cutting edge angle	Nose radius
Medium to high carbon and alloy steels at normal speeds	−5 to 0	−5 to 6	5 to 7	5 to 7	8 to 15	0 to 60	3/32
Carbon and alloy steels at slow speeds	−5	−5	5 to 7	5 to 7	8 to 15	0 to 60	3/32
Low carbon and free machining steels	0 to 5	6 to 10	7 to 10	7 to 10	8 to 20	0 to 30	3/32
Cast iron and malleable iron	−5 to 0	−5 to 6	5 to 7	5 to 7	8 to 15	0 to 60	3/32
Nonferrous	0 to 10	6 to 15	7 to 12	7 to 12	8 to 25	0 to 30	3/32
Austenitic stainless steel	0 to −40	−5 to 10	5 to 7	5 to 7	8 to 15	0 to 60	3/32
Martensitic ferritic stainless	0 to −5	6 to −5	5 to 7	5 to 7	8 to 15	0 to 60	3/32



per cutting edge. And at the higher speeds the disposable carbides are run, rake angle has less effect.

A typical brazed tool may have 0 degree back rake and 6 degree side rake. For the same cutting conditions, a disposable tool would be set at a negative 5 degree back rake and side rake.

Relief—End relief ranges from 5 to 12 degrees, as does side relief.

Both end and side relief should be kept the same. Use angles of 5 to 7 degrees on all cast irons and steels. Larger angles are in order for soft materials such as aluminum, magnesium, plastics and some low carbon steels. Large relief angles give somewhat better tool life if there is no chipping.

Edge Angles—End cutting edge angles of 8 to 15 degrees are used on most standard tools. The angle must be increased if the tool is to follow a cam or profile. The end cutting angle must be at least 6 degrees larger than the greatest plunge angle.

The side cutting edge angle can range from 0 to 60 degrees or more and is varied more than any other tool angle. It has a great effect on cutting speed or tool life. As the angle is increased, the speed, or feed, can be increased for a given tool life, or the tool life can be increased if the speed, or feed, remains constant.

Chatter — Because an increased angle causes the chip to thin and changes the cutting forces, chatter often is encountered. This can sometimes be eliminated by increasing the feed.

Nose radius has somewhat the same effect as the side cutting edge angle. By increasing the nose angle, the finish on the work will improve if there is no chatter.

The angles at which a tool cuts are known as the tool signature. It is always written in the order that it appears in the table at the top of this page.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

Securely and uniformly strapped packages can be stored neatly and safely with better utilization of floor space and an improvement in the housekeeping standards of the storage area

Steel Plant Automates Packaging

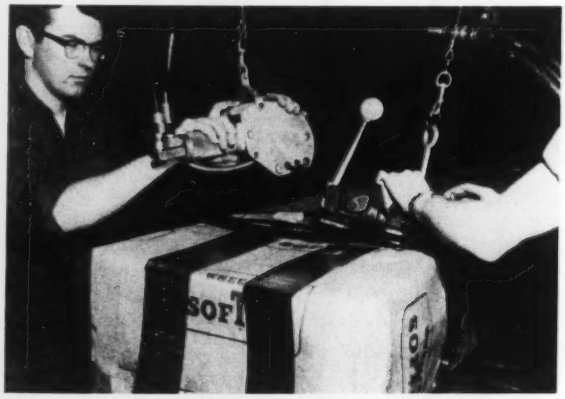
Use of centralized system doubles the rate of packaging sheet steel. Made up of an inclined conveyor, hydraulic and electric tools, it could be applied to other packaging

MECHANIZED packaging provides better utilization of floor space, increases packaging output and integrates shipping with production at Wheeling Steel Corp., Martins Ferry, O.

Method—The new system, designed by Acme Steel Co., Chicago, employs a gravity conveyor, hydraulic tensioning and sealing tools and electric powered steel strapping dispensing equipment. A five-man crew (two wrappers, two strappers and a checker) can package 10 to 15 units an hour. The sheet steel is positioned over the working area by means of an overhead crane.

Packaging begins at the high end of an inclined conveyor which is 85 ft long. Lifts of sheet steel are carefully placed on 5-ft aluminum channels. Wood skid runners are dropped into the channels. They are strapped to each lift as an integral part of the completed package.

Wrapping—A pneumatic brake holds the lift in



An Acme Steel B8A10 hydraulic stretcher applies a predetermined tension to the strapping. It is sealed with a double crimp

position while asphalt-impregnated paper is folded around the steel. Gummed paper holds the covering in place.

The brake is released, and the lift coasts to the steel strapping station midway on the conveyor line.

Strapping—Strips of scrap steel are placed in position to protect the edges of the sheets when strapping is tensioned around the lift.

The tensioning and sealing tools are suspended over this station, within easy reach of the operators.

An Acme Steel hydraulic stretcher is fed 1.25 x 0.035 in. strapping from coils in electric powered floor dispensers. Open-type seals are placed over the strapping and predetermined tension is applied.

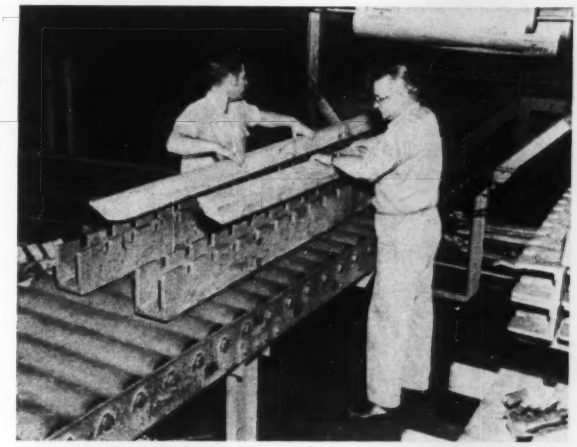
Crosswise straps are threaded through grooves in the aluminum channel, between the lift and wood skid runners. The grooves are 2 x 2 in. and are spaced at 4 in. intervals.

Electric dispensers, mounted on swivel arms over the conveyor line, supply the longitudinal strapping which is fed beneath the skid runners through grooves in the bottom of the aluminum channels. The electric dispensers are resulting in a saving of material over the former method which used precut lengths of strapping.

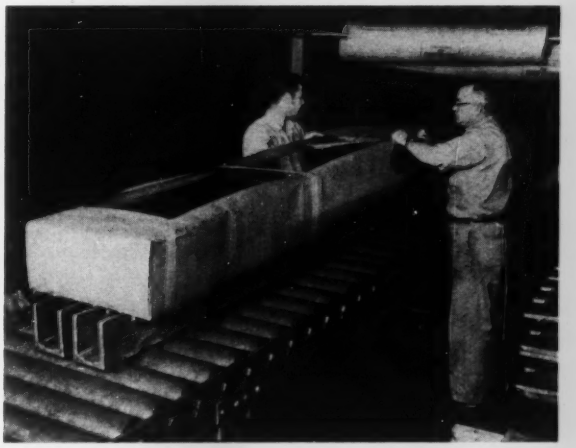
End of Line—All strapping is tensioned, and the runners are bound to the lift to complete reinforcement of the package. The package coasts to the take-off end of the conveyor line where a crane lift removes the unit.

The empty aluminum channels are placed on a return conveyor which carries them to the head of the line to be reused.

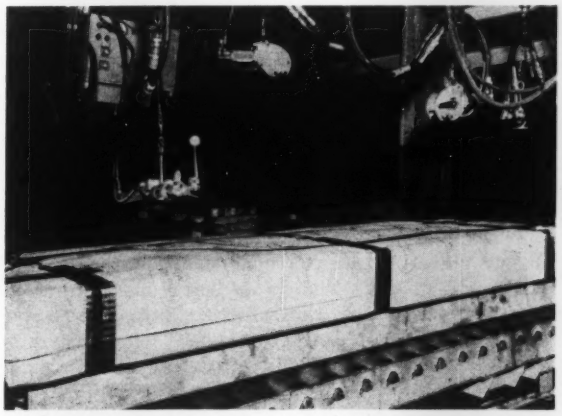
Handling—The strapped packages can be placed safely in high stacks or carried directly to trucks, freight cars or barges for shipment.



Special 5-ft aluminum channels hold wood skid runners which will be strapped to each lift as an integral part of the finished package

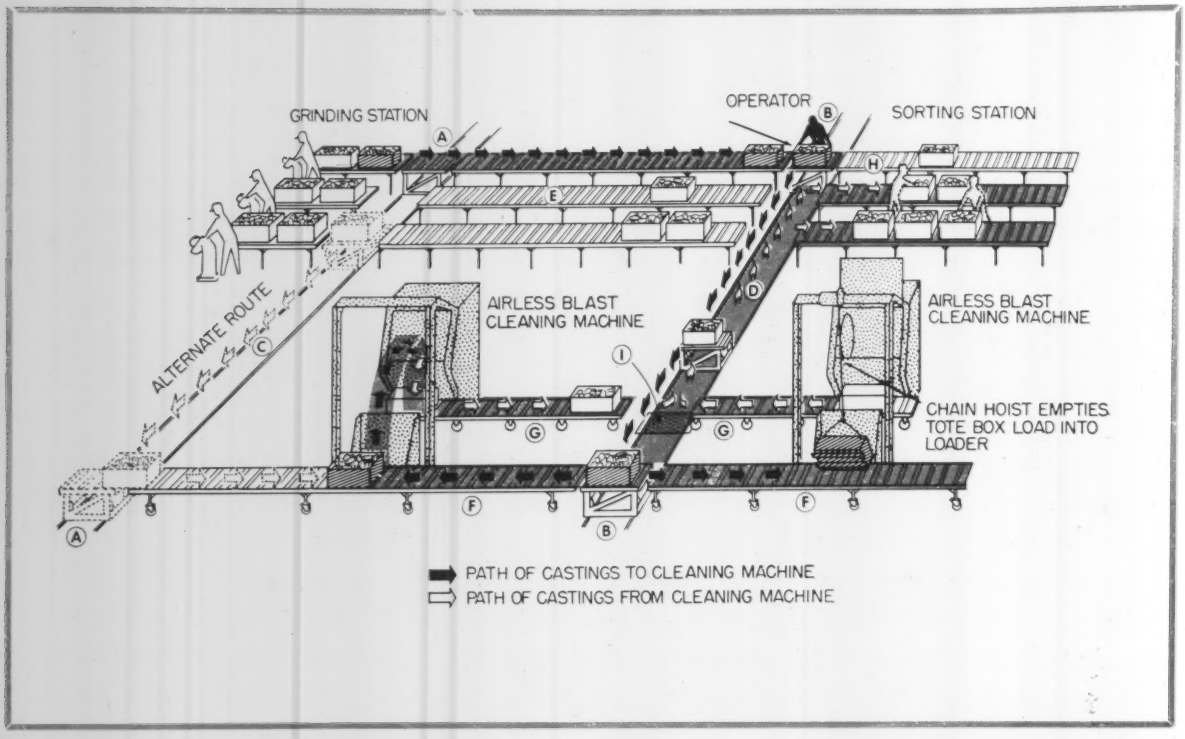


A protective covering of asphalt-impregnated paper is placed over the channels and skid runners. Gummed paper is used to hold the covering in place



Hydraulic tensioning and sealing tools are suspended over the strapping station within easy reach of the operators

Crosswise strapping is delivered from coils in electric powered floor dispensers. Longitudinal strapping is supplied by electric dispensers mounted over the line



Foundry Improves Cleaning

Lifting hook raises tote box and dumps castings into machine loader

Conveying system at Dalton Foundries makes it possible for one man to operate two airless blast machines and move work among three operations

CASTINGS can be moved from grinders to cleaning mills to inspection stations without power devices. The drawing above shows an installation at Dalton Foundries Inc., Warsaw, Ind., operated by one man.

The system has two shuttle cars (A and B) which roll on rail tracks (C and D) and four banks of roller conveyors.

Conveying—Tote boxes of malleable castings are moved away from the grinders by the conveyors at E. Shuttle car B carries them to conveyor F, which moves them to the loader of an airless blast cleaning machine built by Wheelabrator Corp., Mishawaka, Ind.

An electric chain hoist is used to dump the castings into the blast machine loader. A two-pronged lifting hook is inserted into holes in the back of the tote box. The hoist raises the back of the box, causing it to pivot at the front and dump the castings into the loader bucket.

Round Trip—The empty dump box is returned along conveyor F to the shuttle car B which moves it to station I. Here, a hydraulic lift lowers the box to the unloading conveyor G.

The empty box is placed in front of the blasting mill to receive cleaned castings. Then the box is moved to station I which raises the castings to the shuttle car which takes it to the conveyors at H where the castings are sorted and inspected.

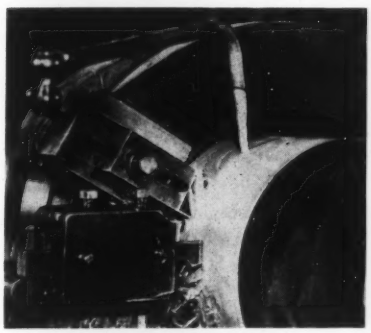
Skinning Pipe Rolls

They are rough turned, finished and polished in one pass of the lathe carriage

AN unusual combination turning method is used to "skin" large steel pipe rolls at Beloit Eastern Corp., Downington, Pa.

Extruded wrought-steel pipe rolls are rough turned, finished and polished in one pass on LeBlond 25 and 32 in. lathes. Accuracy is important; rolls must mate perfectly because they rotate up to 6000 rpm in high speed papermaking machinery. Tolerance is 0.002 in. end to end. Rolls are 8 to 24 in. in diameter and up to 23 in. long.

Tooling—For roughing, a carbide tool is held in a turret tool block mounted on the compound. A special, solid ring type follow-rest bolted to the right carriage wings carries a tool block and high speed steel finishing tool. For polishing a wooden emery paper holder, made like a clamp, is supported on the carriage wing against the turning pressure of the roll.



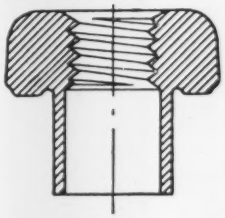
FINISHING TOOL

. . . is mounted on back of follow-rest

Tailstock rigidity is especially important; the tailstock spindle must be extended to make room for the follow-rest when the cut is started. Beliot Eastern uses an in-built antifriction spindle in the tailstock.

Beloit Eastern's new pipe roll shop was planned for minimum material handling and efficient work flow. Raw materials are delivered at one end of the shop and finished rolls come out the other.

NEW Tubular's 2 in 1 fastener



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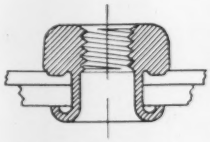
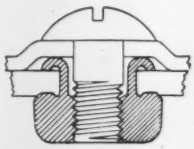
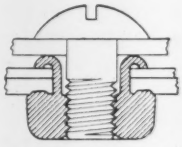
2. provides convenient and fast *ASSEMBLY* or *DISASSEMBLY* of parts



PERMA-NUT after Setting with a Roll Clinch



PERMA-NUT Flush Mounts 2 Parts



PERMA-NUT Fastens 2 Parts, Uses Clinch for Spacer, Fastens 3rd Part into Nut

Here's a revolutionary new type of fastener combining the permanence of a rivet and the assembly and disassembly features of a nut. Fastened automatically with *Tubular's* Automatic Riveting Machines, PERMA-NUTS will save assembly hours and labor — and at the same time give you these additional advantages:

- function as a rivet, permanently fastening two or more parts, making nut available to fasten other parts.
- permanently clinch nut to a single part for fastening of other parts.
- prevent loss of nut.
- allow installation of nuts in hard-to-reach locations or which become "blind" after assembly.
- eliminate drilling and tapping certain holes.
- prevent nut from turning — sixteen radial serrations bite into part when PERMA-NUT is clinched.
- allow you to realize savings in cost over more expensive threaded fasteners.
- will not pull out of rivet clinch when properly set — clinch is stronger than the threads of nut head.

Available in steel, brass or 5056 aluminum, PERMA-NUTS are supplied in standard thread sizes of: 3-48NC-2, 4-40NC-2, 5-40NC-2, 6-32NC-2, 8-32NC-2, 10-24NC-2 and 10-32NF-2. PERMA-NUTS of special sizes or with various kinds of plating can be supplied to meet special applications.

Send for sample, design data and specifications of standard PERMA-NUTS. If you have an immediate fastening problem, call your nearest *Tubular* Branch Office. PERMA-NUTS are now being used for vacuum cleaner shields, on protective guards, electronic chassis and similar applications. Where fastening is required PLUS assembly and disassembly features, PERMA-NUTS can be the answer to your problem.

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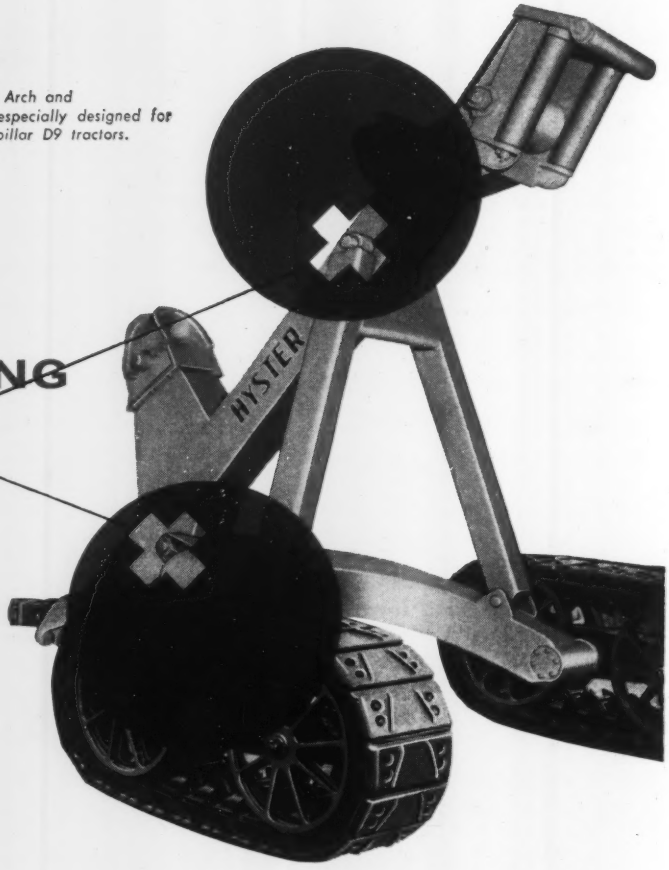

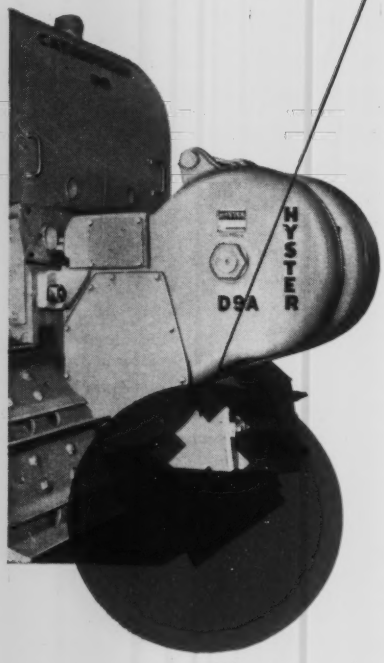

Hyster Company Makes Double-Cut on Costs!

Hyster Company, Portland, Oregon, out to beat machining costs of components in their logging arches and winches and a drawbar bracket, turned the trick by switching from another material to OSTUCO Seamless Steel Tubing.

Drawbar Bracket—Use of OSTUCO Tubing cut material and machining costs from $120,500 to $81,820 annually for a reduction of 32%.

Logging Arch—Used as sleeves in the Hyster "98" Arch, OSTUCO Tubing reduced material and manpower costs 10% annually.

In addition, Hyster engineers report the equipment is stronger and better able to take the strain of heavy hauling and winching jobs over rough logging terrain.

Perhaps you have hidden profit-robbers in your product. Better contact OHIO SEAMLESS for recommendations . . . without obligation on your part, of course.

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CANADA: Railway & Power Engr. Corp., Ltd.

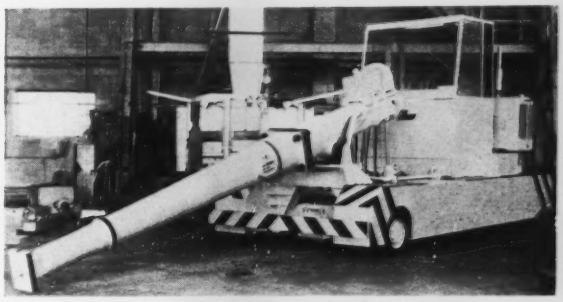
EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY, 225 Broadway, New York 7, New York

Maneuverable Charging Machine Turns on Three Wheels

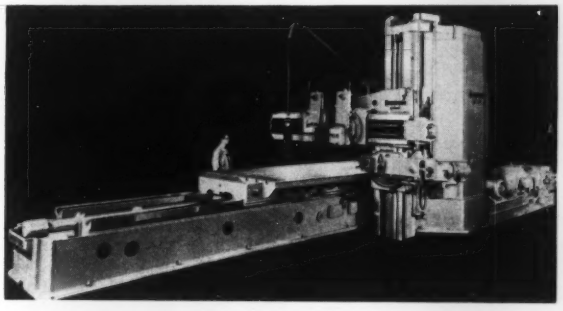
A tricycle steering mechanism enables these charging machines to turn on their own wheelbases.

The machines (capacities: 2000 to 20,000 lb) are furnished with boxes for charging scrap, limestone and loose materials into melting furnaces or with tongs for handling ingots, billets, blooms, slabs and other solid forms.

Hydraulic pumps transmit power for all operations. These include raising, lowering, tilting and rotating the work head and moving the machine over the floor. *Write*: Salem-Brosius Inc., Box 2222, Pittsburgh 30, Pa. *Phone*: Walnut 2-2200



This Planer Eliminates Manual Positioning



Two-speed traverse motors are used in this planer. Maximum speed is used for approximate positioning and slow speed for close power positioning of the heads.

Power rapid traverse, power rail elevation, automatic power rail-lock and automatic way lubrication aid the operator.

This planer (sizes 60 x 60 in. and above) comes with either the conventional single circuit or with the high speed triple circuit. *Write*: Rockford Machine Tool Co., Rockford, Ill. *Phone*: 3-7611

Automatic Jig Borer Is Controlled by Tape

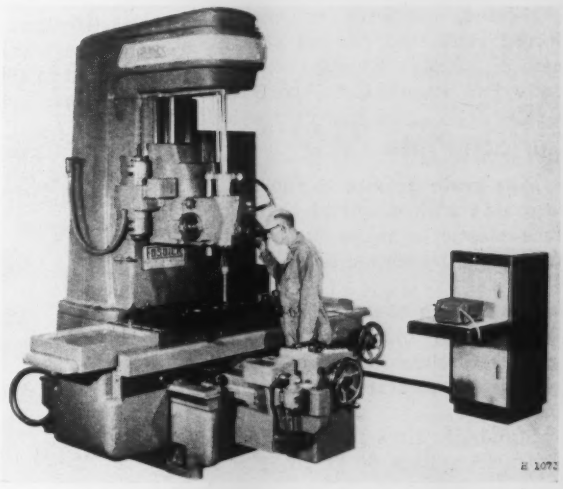
Special jigs and fixtures are eliminated in the use of this automatic jig borer. It is programmed by a tape and has a table that can be positioned to 0.0001 in.

The table is positioned by selecting the proper measurement on the motor driven drum dials. The operator presses a button which positions the table and sets the spindle speed and feed according to values punched in the tape.

Electromagnetic clutches select one of 16 speeds from 30 to 1800 rpm. Eight feed rates from 0.0005 to 0.010 in. per minute can be selected.

Dimensions from the part prints are punched directly onto the tape. No coding is needed since a decimal tape is used.

Tools are set in the toolroom and numbered according to the operations program. The operator needs only to follow the program. *Write*: Fosdick Machine Tool Co., Cincinnati, O. *Phone*: Kirby 1-4545



NEW PRODUCTS and equipment

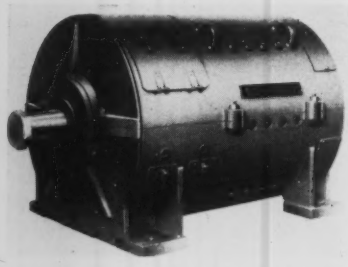
Machine Cuts Panels

Cross cutting, bevel cutting and ripping of metal and other materials are handled by this machine. It has a cutting stroke of 62 in. for cutting panels.

Models of the machine are varied by using different motor designs (3 to 10 hp). *Write*: DeWalt Inc., subsidiary of American Machine & Foundry Co., Lancaster, Pa. *Phone*: Express 3-5831

Mill Motor

The frame of this motor is horizontally split to simplify inspection and maintenance.



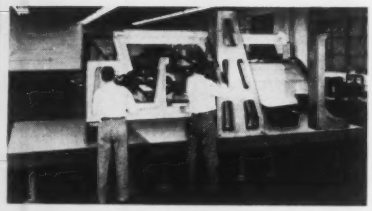
Totally-enclosed, protected self-ventilated, protected or enclosed forced ventilated designs are furnished. *Write*: Elliott Co., Jeannette, Pa. *Phone*: Lafayette 3-5422

Surface Plate

Fine grain granite in the rough is coated with a special hard surface plastic to make these plates for layout, inspection and assembly work.

The coating of plastic eliminates the grinding and polishing of the granite to close tolerances. These plates are accurate planes within 0.002 in.

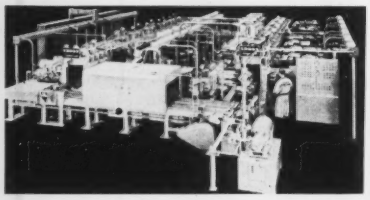
Standard sizes of the plates range from 24 x 60 in. to 72 x 96 in. with two or four ledges or none.



Thickness varies from 6 to 12 in. *Write*: Renaud Plastics Inc., 5422 S. Cedar Road, Lansing 17, Mich. *Phone*: Turner 2-2411

Special Parts Machine

This 17-station machine produces an integral front wheel spindle and steering arm at the rate of 144 right-hand and 144 left-hand parts an hour.



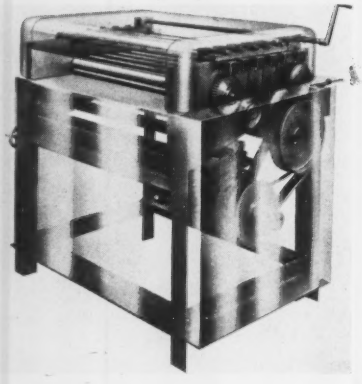
The parts are carried by pallet-type work holding fixtures, which are transferred through the machine. A pushbutton operates the power wrench to clamp and unclamp the parts in the fixtures.

Maintenance is simplified by the use of interchangeable parts. *Write*: Cross Co., Detroit, Mich. *Phone*: Walnut 1-3000

Roll Straightener

Soft materials can be handled by this 11-roll straightening machine. It handles steel stock in thicknesses from 0.010 to 0.200 in. depending upon the width. Material width is limited to 48 in.

Rolls are driven by gears. The upper roll train is equipped with a cam-operated quick release to permit insertion of the stock between the front pinch rolls. This allows the feed to be halted instantly.



A worm gear reduction on the variable drive control gives accurate control of the speed. *Write*: Benchmaster Mfg. Co., 1835 W. Rosecrans, Gardena, Calif. *Phone*: Faculty 1-0411

Automatic Press Feed

The 12-in. Rol-Di-Feed is a self-contained, cam driven unit that can be mounted to feed in any direction for any type of piercing, blanking, compound, progressive or draw die.

It requires no connection to the press crankshaft and uses the full 360-degree of press shaft rotation, feeding on the upstroke and downstroke. This permits stock feeds up to 12 in. per cycle.

The unit handles paper, plastics, fiber or steel in thicknesses of 0.003 to 3/16-in. Open side design

accommodates stock of almost unlimited width. *Write*: H. E. Dickerman Mfg. Co., 321 Albany St., Springfield, Mass. *Phone*: Republic 2-7919

Bearing Assembly

This thrust bearing is used for steel furnace table shafts. It has a load capacity of 76,500 lb at 100 rpm.

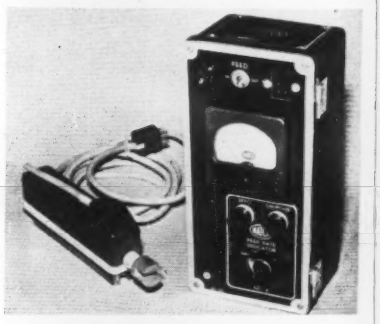
The rollers are through hardened to 59 to 63, Rockwell C scale, and can withstand operating temperatures up to 300°F. *Write*: Rollway Bearing Co., 541 Seymour St., Syracuse, N. Y. *Phone*: 75-2121

Feed Rate Indicator

An indicator to measure feed rates of 0 to 10 and 0 to 50 in. a minute gives instantaneous readings. It can be used for setting the hydraulic feeds on machine tools.

A movable contact creates a signal (indicated on a meter)

NEW PRODUCTS and equipment



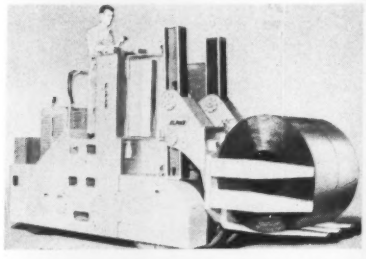
which varies with the feed rate. It uses miniature vacuum tubes and is powered by hearing aid batteries, with a standard flashlight cell for the tube filament power.

The potentiometer operating rod is fitted with a permanent magnet for self-attachment to the machine tool. *Write*: National Automatic Tool Co. Inc., Richmond, Ind. *Phone*: 2-1183

Coil Handling Truck

This truck (20,000-lb capacity) will pick up coils which are stored in a horizontal position, upend them during travel and deposit them in a vertical position for processing.

After processing, the truck may be used to change position of the coils before replacing them in storage.



The upending is accomplished by use of rotating head on the truck. *Write*: Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, O. *Phone*: Utah 1-6200

Fork Truck Lifts 18 Ft

Ceiling high stacking is possible with these three-section fork trucks. The maximum height ranges from 126 to 216 in. with a lowered height of 65 to 96 in.

The triple lift combines three sets

Specify *Michigan* Tubing for economy and versatility

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ROUND

¼" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
⅜" to ¾"	16 thru 22	⅜" minimum side to 5" maximum side
¾" to 1"	11 thru 22	
1" to 2"	11 thru 20	
2" to 3"	11 thru 18	

Carbon 1010 to 1025

Standard Sizes

Tube Diameter O.D. Size	Maximum Wall Decimal	BWG Gauge	Minimum Wall Decimal	BWG Gauge
⅛	.065	16	.022	24
¼	.083	13	.022	24
½	.095	13	.022	24
⅝	.095	13	.022	22
¾	.095	13	.028	22
⅞	.095	13	.028	22
1	.095	13	.028	22
1⅛	.095	13	.028	20
1¼	.095	13	.035	20
1⅜	.095	11	.035	20
1½	.120	11	.035	20
1⅝	.120	11	.035	20
1¾	.120	7	.035	20
1⅞	.180	7	.035	20
2	.180	7	.035	20
2⅛	.180	7	.035	20
2¼	.180	7	.035	20
2⅜	.180	7	.035	20
2½	.180	7	.035	20
2⅝	.180	7	.035	20
2¾	.180	7	.035	19
2⅞	.180	7	.042	19
3	.180	7	.042	19
3⅛	.180	7	.042	19
3¼	.180	7	.042	18
3⅜	.180	7	.049	18
3½	.180	7	.049	18
3⅝	.180	7	.049	18
3¾	.180	7	.049	
3⅞	.180			
4				

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4. Complete facilities for the COLD DRAWING, ANNEALING and TESTING of tubing we manufacture.

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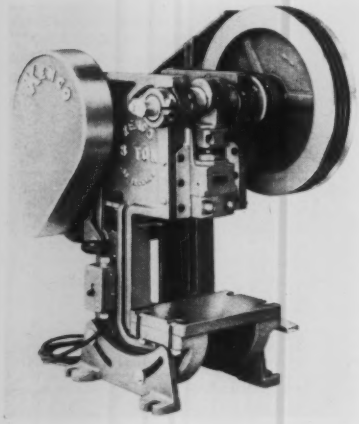
of upright channels. The nested assembly is locked to eliminate any possibility of dislocation by sudden shock.

Twelve rollers on the assembly absorb both radial and thrust loads and prevent sway when a high load is being placed. *Write*: Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich. *Phone*: Woodward 2-6561

Punch Press

This 8-ton punch press operates at speeds of 50 to 200 strokes a minute. Hand feeding, deep drawing, continuous operation, roll feeding and dial feeding can be used.

The drive mechanism features

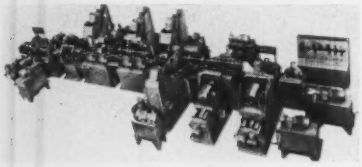


two flywheels; the first flywheel creates the driving momentum which is transmitted to the final drive pulley. *Write*: Kenco Mfg. Co., 5211 Telegraph Road, Los Angeles 22, Calif. *Phone*: Angelus 1-7955

Manifold Machine

This machine performs 41 operations at 20 stations to completely mill and machine both right-hand and left-hand exhaust manifolds.

The operations include 15 drilling, 8 spotfacing, 5 milling, 5 countersinking, 4 tapping, 2 reaming and 1 counterbore and probe.



A complete part is finished every 25 seconds. *Write*: Buhr Machine Tool Co., Ann Arbor, Mich. *Phone*: Normandy 2-5646

Overhead Sand Hopper

This package unit can provide sand at several stations for molding operations.

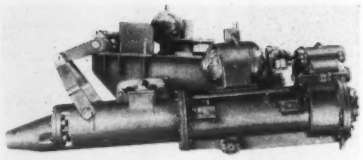
The sand is delivered by the front-end loader. A series of con-

veyors takes it to each hopper where it is diverted by a plow. *Write*: Foundry Division, Jeffrey Mfg. Co., Columbus 16, O. *Phone*: Axminster 4-3331

Clay Guns

These clay guns, with capacities of 3 and 6 cu ft, are for use with electric furnaces. They can be used for slugging tapping holes.

The 3 cu ft gun is pedestal mounted. It is operated by three separate electric motors which move the gun horizontally, forward and downward into the tapping hole.

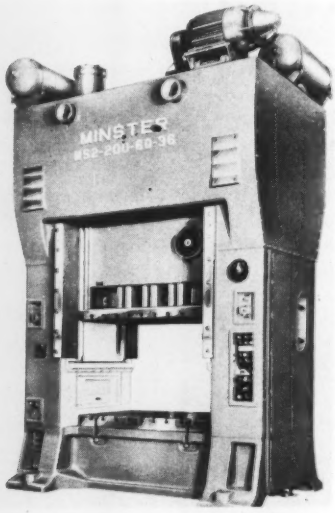


Overhead rails are used for positioning the 6 cu ft gun in front of the furnace. It enters the tapping hole by a forward and downward movement. *Write*: William M. Bailey Co., 1221 Banksville Road, Pittsburgh 16, Pa. *Phone*: Lehigh 1-6131

Straight Side Press

Each of these presses (150 to 500 tons) has an air friction clutch and brake unit located on a slower turning intermediate shaft instead of within the flywheel on the high speed drive shaft.

The user may select either the faster speeds of a conventional single-geared machine or the slower speeds of a double-geared press.

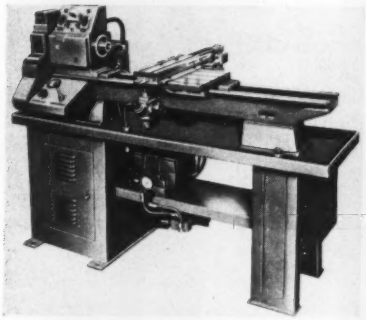


All air, lubrication and electrical systems are complete, enclosed within the press frame line. *Write*: Minster Machine Co., Minster, O. *Phone*: Minster 194

Boring Machine

This semiautomatic turning and boring machine can perform several machining operations simultaneously or in a continuous sequence. Turning, boring, facing, forming, grooving, chamfering, beveling and cutting are performed to close tolerances.

NEW PRODUCTS and equipment

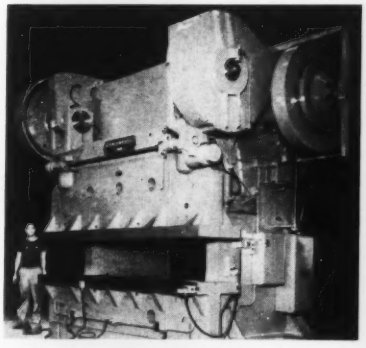


Simple block toolholders, carbide insert bits and standard boring bars will handle most jobs. *Write*: Clausing Division, Atlas Press Co., 21195 N. Pitcher St., Kalamazoo, Mich. *Phone*: Fireside 5-7157

Press Brake

The 40 Series machines measure 8½-ft between housings and have a die surface of 12 ft.

Heavy corrugating and punching dies can be mounted on the bed and ram. Both are 28 in. wide. The brake has a stroke of 8 in. and a 22-in. shut height.



A power take-off from the main shaft drives automatic feeding and withdrawal units. Speeds are 5 and 20 strokes a minute. *Write*: Cincinnati Shaper Co., Hopple, Garrard and Elam streets, Cincinnati 25, O. *Phone*: Kirby 1-5010

Turntable

This powered conveyor turntable is designed to rotate cartons, cases and packages through 180 degrees.

It may be used in live roller or powered belt conveying systems. It is driven by a spur gear train working from a variable speed

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Load Hoisting
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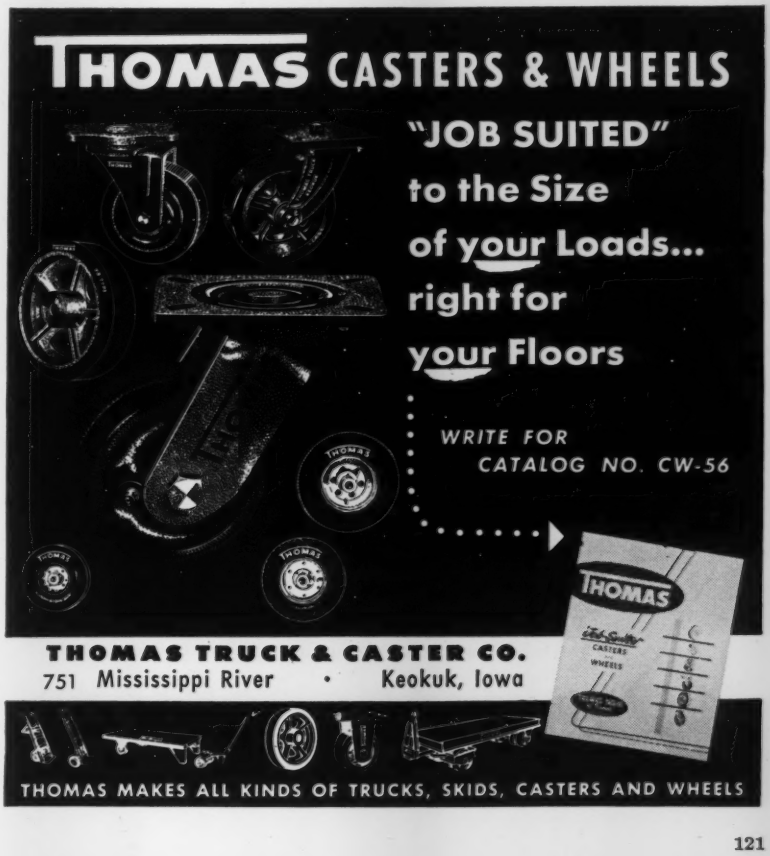
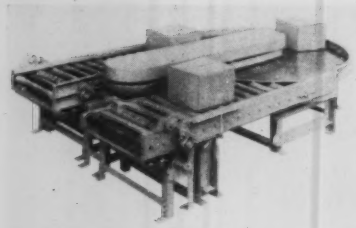


NEW PRODUCTS and equipment



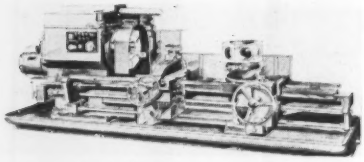
motor. *Write*: Alvey-Ferguson Co., 1586 Disney St., Cincinnati 9, O. *Phone*: Redwood 1-7000

Heavy Duty Turret Lathe

This 36-in. swing machine is equipped with a 75-hp drive motor. A hydraulic-shift headstock couples the two-speed motor to the spindle for selection of 28 turning speeds from 10 to 280 rpm.

A single lever engages the forward and reverse clutches, neutral and brake positions and initiates the gear shift or speed change.

Speed selection can be made while the machine is cutting. At each setting, the operator can read the revolutions per minute and surface speed directly from the preselector dial. *Write*: Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, O. *Phone*: Henderson 1-5580



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Now Proven In Service

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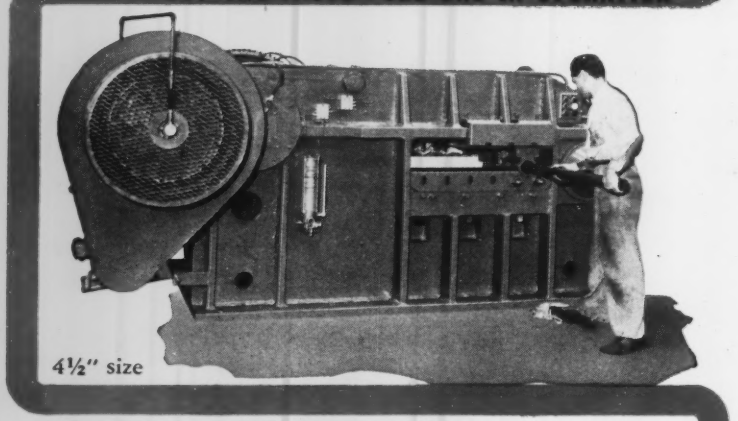

- Simplicity of Design. Clean, square cuts. Low maintenance.
- You'll be amazed at it's performance. You'll be surprised at the price.
- Made in 3", 4½", 6½" sizes and larger. Choice of hand, semi-automatic or fully automatic feed.

Full details and specifications are given in Bulletin SP-56.

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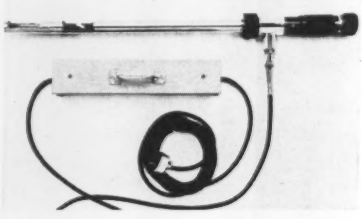
Borescope

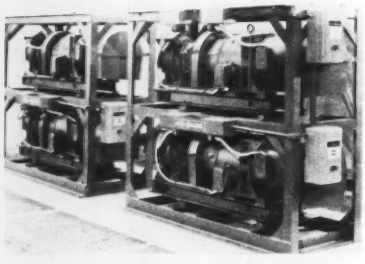
This tool enables you to inspect the inside of tanks, vessels, combustion chambers and other equipment. It has a magnification of ten power and a field of vision 9 in. in diameter at a distance of 24 in.



For illumination, the viewing head has a 100-watt lamp with a 13/16-in. diameter. *Write*: Lenox Instrument Co., 2010 Chancellor St., Philadelphia 3, Pa. *Phone*: Rittenhouse 6-6653

Framework Is Compact

This supporting framework is for direct-connected motor-generator sets (motors 10 hp and larger) used in arc furnace control of electrodes.



Each welded steel framework has space for two motor-generator sets. Frames can be mounted on top of one another. *Write*: Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. *Phone*: Spring 4-3600

NEW literature

Write directly to the company for a copy

Instrumentation

Bulletin 57-687-297, 12 pages, gives specifications of instruments for transmitting, indicating and recording pressure, flow, temperature, level and gas analysis. Hays Corp., Michigan City, Ind.

Motor Maintenance

Bulletins 51X8581 and 51X8582 use cartoons to illustrate steps in motor maintenance. Allis-Chalmers Mfg. Co., Box 512, Milwaukee 1, Wis.

Power Saw

A vertical feed power saw with 24 x 24 in. capacity is covered in this 4-page bulletin. DoAll Co., Des Plaines, Ill.

Packaging

The packaging of heavy products is explained in a 28-page booklet. Hinde & Dauch Paper Co., Sandusky, O.

Crane Parts

Roller bearing crane wheels, hook blocks, crane gearing and couplings are described in this 16-page bulletin. Drafto Corp., Cochranton, Pa.

Brass Valves

A 4-page bulletin covers composition-disc globe, angle and lift check valves. Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.

Automation

This 4-page bulletin describes several standarized units used to automate small part assembly operations. Dixon Automatic Tool Inc., 2300 23rd Ave., Rockford, Ill.

Floor Maintenance

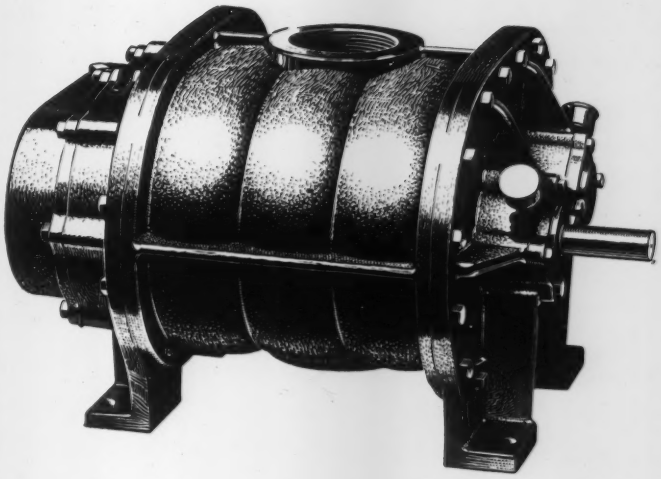
Synthetic resins as protective coatings for floors are described. They are resistant to oil and grease. Building Products Division, L. Sonneborn Sons Inc., 404 Fourth Ave., New York 16, N.Y.

Steel Descaling

Mechanical descaling of steel is described in this 8-page bulletin. Wheelabrator Corp., 1157 S. Byrkit St., Mishawaka, Ind.

Variable Speed Belts

A line of belts is described in bulletin 1640-B1 P, 8 pages. Tables



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- Impellers make no internal contact keeping friction loss small.
- Higher operating speeds result in reduced first cost, less weight and floor space. Horsepower is determined by operating pressure, resulting in maximum power savings.
- Drives may be direct-connected to electric motors, turbines, steam or gas engines . . . or speed reducing gears or V-belts.

In chemical, waste treatment, refining, paper and many other industries, R-C blowers have earned outstanding acceptance. R-C application engineers will welcome the opportunity to help solve your problem, large or small. Write for Bulletins AF-154 on small blowers or RB-154 on large units.

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757 Hillside Avenue, Connersville, Indiana. In Canada—629 Adelaide St., W., Toronto, Ont.

NEW LITERATURE

list corresponding belts of various manufacturers. Advertising & Sales Promotion Department, Worthington Corp., Harrison, N. J.

Safety Check List

This 8-page folder contains a check list that can help you determine whether combustible materials (uncontrolled flammable gases, vapors, dusts and liquids) are making your plant unsafe. Department HF, Crouse Hinds Co., Wolf and Seventh North streets, Syracuse 1, N. Y.

Blowers

This 52-page catalog (8314) describes the size ranges and configuration of fan wheels and motors. American Blower Division of American-Standard, Detroit 32, Mich.

Expansion

A 4-page folder, "Why Postpone Plant Expansion," illustrates financing plans. West Penn Power Co., Cabin Hill, Greensburg, Pa.

Screw Conveyor

The conveyors discussed in this bulletin will handle bulk materials from fine-mesh size up to 2 in. in diameter. Canton Stoker Corp., 300 Andrew Place S.W., Canton 1, O.

Tool Material

A 4-page bulletin describes a high-velocity metallic cutting material. Newcomer Products Inc., Latrobe, Pa.

Reamer Chart

Reamer sizes ranging from 0.0400 to 0.5010 in. are listed on this wall chart. DoAll Co., Des Plaines, Ill.

Rotary Table

This 2-page bulletin describes a 36 in. tilting rotary table. Pratt & Whitney Co., Charter Oak boulevard, West Hartford 1, Conn.

Tachometers

Generators and indicating or recording instruments for measuring speeds of rotating equipment are described in this 12-page bulletin, GEC-1258A. General Electric Co., Schenectady 5, N. Y.

Welders

This 4-page bulletin describes 300, 400 and 500-ampere ac and dc welders. Lincoln Electric Co., Cleveland 17, O.

Proving Rings

Proving rings and their use are explained in this 12-page bulletin. It describes the procedure for assuring accuracy in testing machines. Morehouse Machine Co., 233 W. Market St., York, Pa.

Broaching Machines

This 4-page bulletin, GR-57, describes horizontal broaching machines for gun rifling. Colonial Broach & Machine Co., P.O. Box 37, Harper Station, Detroit 13, Mich.

Heat Resistant Castings

This set of data sheets contains property information on the heat resistant cast alloys. Alloy Casting Institute, 286 Old Country Road, Mineola, N. Y.

Abrasive Cutting Unit

Bulletin 5705, 8 pages, describes deburring, abrading and cutting of delicate materials, using a high speed stream of gas-propelled abrasive particles. S. S. White Industrial Division, 10 E. 40th St., New York 16, N. Y.

Computer

This 4-page bulletin explains how a computer has been integrated into

NEW LITERATURE

a manufacturing system. It was used in the design of gears. Bendix Computer Division, Bendix Aviation Corp., 5630 Arbor Vitae St., Los Angeles 45, Calif.

Profiling Tools

Four styles of throwaway carbide tools are described in bulletin B-105, 4 pages. Kennametal Inc., Latrobe, Pa.

Wire Rope

This 16-page bulletin, DH-128-B, contains data on applications, diameters and construction features of wire rope. American Cable Division, American Chain & Cable Co. Inc., Wilkes-Barre, Pa.

Blind Rivets

Applications of blind rivets are explained in this 10-page bulletin. Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.

Iron Powder

The typical chemical analysis, screen analysis, and strength data of sponge iron powder are given in this 4-page bulletin. Hoeganaes Sponge Iron Corp., Riverton, N. J.

Electric Connectors

Bulletin GB6, 32 pages, describes connectors (battery, power and heavy duty) for industrial uses. Cannon Electric Co., 3208 Humboldt St., Los Angeles 31, Calif.

Motor Control Centers

This 32-page booklet contains engineering data for selecting and planning a motor control system. Cutler-Hammer Inc., 315 N. 12th St., Milwaukee 1, Wis.

Material Handling

Containers for different materials are described in this 16-page bulletin. Continental-Diamond Fibre Corp., Newark, Del.

Furnaces

This catalog, 36 pages, describes furnace designs for melting ferrous and nonferrous metals. Stroman Furnace & Engineering Co., Franklin Park, Ill.

Fork Lift Trucks

Two bulletins, 1348A and 1395, describe gasoline or LP-gas powered fork lift trucks with capacities of 5000 and 6000 lb. Baker-Raulang Co., Cleveland 2, O.

Filtration

Tubular, vertical and horizontal filters for use in plating are described in this 16-page bulletin, EP-100. Industrial Filter & Pump Mfg. Co., 5900 Ogden Ave., Chicago 50, Ill.

Gearmotors and Drives

The reduction ratios and output speeds of different gearmotors and package drives are explained in this 8-page bulletin, DB-3650. Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa.

Using Overhead Space

This 12-page bulletin, M32, explains how to utilize space with overhead handling systems. Whiting Corp., Harvey, Ill.

Gas Chemistry

The principal factors in atmosphere heat treating (furnace, gas generator and controller) are described in this 8-page bulletin, SC-178. Surface Combustion Corp., Toledo 1, O.

6000-Lb Fork Truck

The truck described in this 4-page bulletin, YR-60-A, is for outside handling. Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich.

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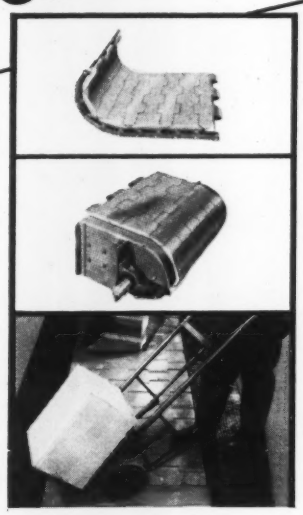
conveyor belting!

MOVING "SIDEWALK" WILL HANDLE WIDE RANGE OF MATERIALS



May-Fran proudly announces a new concept in materials handling . . . the May-Fran FLAT-TOP steel conveyor belt. Precision-forged steel plates interlock snugly to form a rugged, flat-surfaced conveyor belt ideal for assembling appliances, automobiles and other types of heavy products or for handling hot, heavy or rough materials. Special May-Fran link design forges the entire belt into a rugged, integral unit capable of negotiating either *concave* or *convex* curves—yet permits rapid assembly or disassembly.

Designed especially for flush-with-floor as well as extended surface mountings involving heavy-duty operations, the FLAT-TOP steel conveyor has no stationary or moving parts above the surface of the belt. In floor mounted applications, there are no aisle obstructions to disrupt normal plant traffic . . . employees and mobile equipment can safely cross the FLAT-TOP belt while it is moving. This special flat-deck design also permits the handling of materials that extend beyond the width of the belt.

The May-Fran FLAT-TOP is specifically engineered to provide all the advantages of old-fashioned slat-type belting while eliminating the disadvantages and safety hazards common to slat conveyors. Tightly meshed belt links prevent tools and small assembly parts from falling through the belt.

Write and tell us about your materials handling problem. May-Fran engineers will be happy to tailor a FLAT-TOP steel conveyor belt to your requirements.

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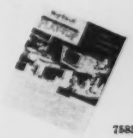
For further details ask for special FLAT-TOP bulletin.



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STEEL MEN!

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BECAUSE Corhart Electrocast sells for several times more than ordinary clay blocks, some operators have gotten the impression that a Corhart tank costs three or four times more than an all-clay furnace.

Nothing, however, could be further from the truth. By *balancing* his furnace with the proper amount of Electrocast, the average Corhart customer adds so little to the installation cost that the difference is repaid by a *fractional part of the extra production gained.*

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WE RAN this ad for a Corhart Electrocast Refractory a little over 25 years ago—back when only a handful of glass manufacturers would think of using this new product, "one of the world's highest-priced refractories". Yet today virtually every furnace in the glass industry uses Corhart Electrocast . . .

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QUALITY ECONOMY ENDURANCE

CORHART 104 ELECTROCAST REFRACTORY

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Louisville 10, Kentucky, U.S.A.—Telephone SPring 8-4471.

Market Outlook

CHANCES are good for stability in steel prices until next July 1 (see page 53).

Reasons: 1. Steel users are finding it difficult to pass on or absorb increased costs. 2. Numerous segments of the public are expressing resistance to price increases. 3. Steel companies covered part of their current cost increases through upward adjustments in extras several months ago.

Last summer's increases in steel base prices (they averaged $8.50 a ton) were followed by advances in extras, beginning last December. Extras were raised an average of $5 a ton.

HIGHER PRICE TAGS—The base price increases instituted last week by U.S. Steel Corp., the pace setter, averaged $6 a ton. Other producers were following this pattern, and in the week ended July 2 enough advances had been posted to push STEEL's price composite on finished steel to $145.74 a net ton, an increase of $5.50 over that of the preceding week.

PIG IRON UNCHANGED—STEEL's price composites on pig iron held unchanged. (They did not go up with steel prices.) Pig iron rose $2 a ton last March. STEEL's price composites on pig iron are: $64.23 a gross ton on basic iron, $64.70 on No. 2 foundry iron and $65.77 on malleable.

SCRAP DECLINES—Prices of steelmaking scrap were not influenced upward by new steel prices. The reverse happened. Scrap eased off a bit and lowered STEEL's price composite on steelmaking grades to $55.33 a gross ton, a decline of 50 cents from that of the preceding week. Scrap prices had been on the upgrade.

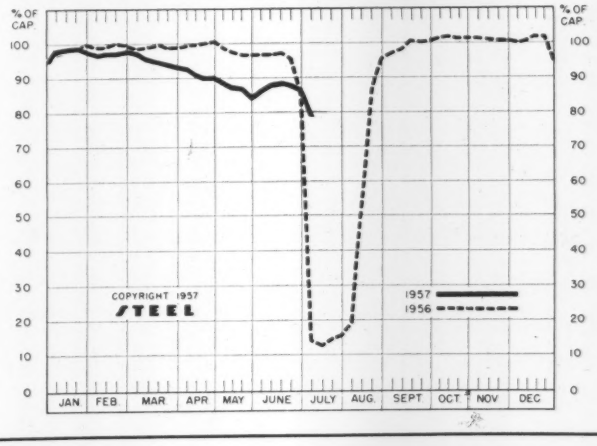
In contrast with price increases on domestic steel, there are decreases on some forms of imports, which stem from lowered costs of transportation. Bar size angles and structural angles went down $4 a ton at North Atlantic ports and $5 a ton at South Atlantic, Gulf Coast and West Coast ports. I-beams and channels declined $7 a ton at North Atlantic ports, $8 a ton at South Atlantic and Gulf Coast ports and $8.20 a ton at West Coast ports.

IMPORT BUSINESS LAGS—The imported steel business is lagging, particularly in the major tonnage items like plates, shapes, bars and sheets. More tonnage in plates and shapes is moving out of this country than is coming in. Reasons: Foreign prices are higher than U.S. prices, and export demand is strong.

PRODUCTION DROPS—Steel production is ebbing as a result of the Fourth of July holiday and the summer vacation season. In the week ended July 7, production of steel for ingots and castings was at a new low for the year—78.5 per cent of capacity, a decline of 7.5 points from the preceding week's rate. The current rate yields 2,009,200 net tons. It is far above the 344,665 tons of a year ago during the steelworkers' strike.

VACATION FOR ALL—Current needs for steel are reduced because of the universality of metalworking plant shutdowns for summer vacations. The weeks immediately following the July 4 holiday are favored for vacations. Some metal consuming plants are closing down so completely that they won't even take in steel shipments from mills.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended July 7	Change	Same Week 1956	Same Week 1955
Pittsburgh	83	— 8*	2.5	91
Chicago	84	— 0.5*	6	92
Mid-Atlantic	89	— 4.5	9	89
Youngstown	68.5	—11.5	5	98
Wheeling	72	—10.5	56	95
Cleveland	77	—12.5*	0	94
Buffalo	85.5	—17	0	100
Birmingham	92.5	0	2.5	93.5
New England	52	0	10	73
Cincinnati	95.5	— 4	69.5	54.5
St. Louis	80.5	+ 1.5	93.5	98.5
Detroit	98.5	—15.5	15.5	95
Western	100	0	33	101
National Rate	78.5	— 7.5	14	89.5

INGOT PRODUCTION‡

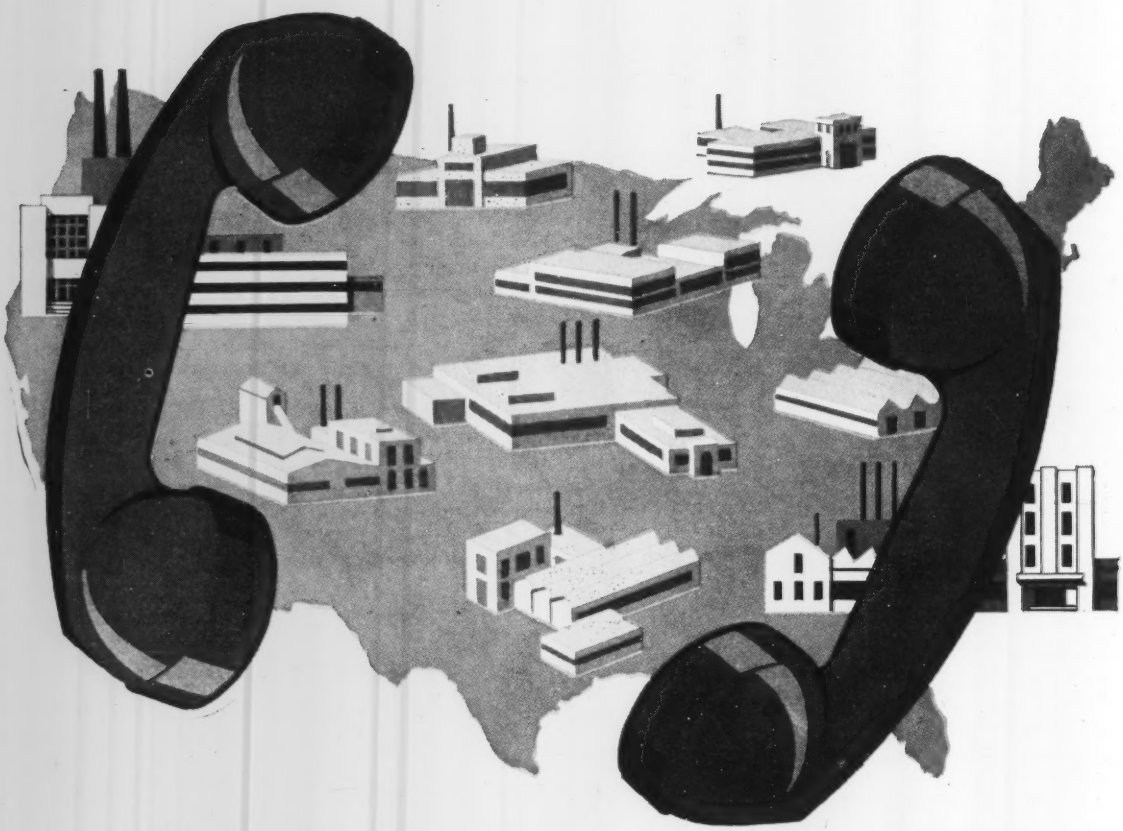
	Week Ended July 7	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	126.0†	133.8	139.4	18.8
NET TONS (In thousands)	2,024	2,150	2,240	302

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—p. 47

Technical Outlook—p. 95

What's causing the swing to that new UNITRODE® nipple?



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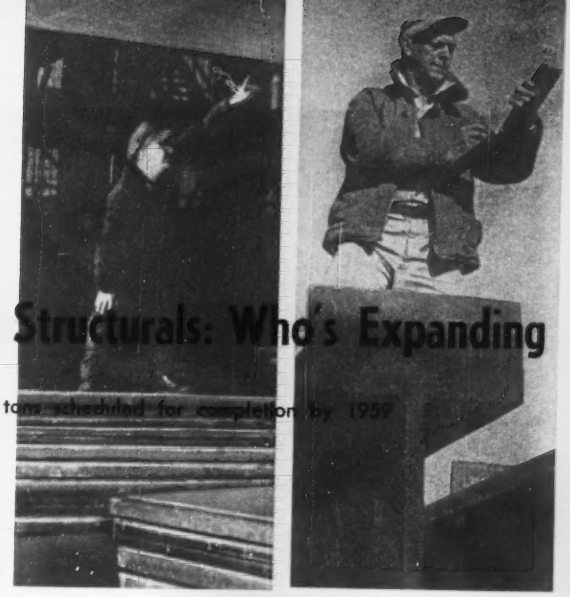

Plates and Structurals: Who's Expanding

Net tons scheduled for completion by 1959

COMPANY	PLATES	STRUCTURALS
U.S. Steel Corp.	———1,300,000———	
Bethlehem Steel Co.	300,000	
Kaiser Steel Corp.	267,000	49,500
Lukens Steel Co.*	127,000-159,000	
Granite City Steel Co.	66,000	

*To be completed early in 1959.

Heavy Steel Eases Off

Wide flange beams and plates over 1 in. thick are still in tight supply. Lighter items are loosening up. Expansion will bring supply, demand into balance by 1960

SUPPLY is slowly catching up with demand for plates and structurals, but producers believe it will be at least another year or two before a balance is reached. There are four indications of this.

Expansion — The table above shows there is little interest in the expansion of structural producing facilities, but plate mills are still on the upswing. So it isn't too surprising to find that producers report a better balance for structurals while plates are still fairly tight. In addition to the above, Phoenix Iron & Steel Co., Phoenixville, Pa., a subsidiary of Barium Steel Corp., is in the engineering phase of a program which will greatly increase its structural and plate capacities. Completion dates have not been set.

Light Products—During the first half, there has been a noticeable letup in demand for the lighter shapes and plates under 1 in. thick. (Wide flange beams and heavy plates are still tight.) The ability of the steel industry to adjust its product mix in favor of these items has been a prime factor in keeping customers fairly satisfied over the last few months. But most producers anticipate a reduction in this tonnage during the third quarter. Some say a saturation point is being reached for light plates. One producer says he would gladly roll strip plates today, but there just isn't any demand for it.

Delivery Time—Delivery times are shortening as supply approaches demand. While one large producer is behind two to four weeks on heavy plates and structurals, most are able to operate on schedule. One producer says delivery is down from four months last year to four weeks now. Most others report delivery as the same or better than it was a year ago.

Operating Rate—This segment of the industry has been running at 100 per cent of capacity during the first half, and it will come close to it in the second. But two or three producers indicate they may run no more than 90 per cent of capacity for plates, looking at the year as a whole, while one structural roller thinks he may go down to 80 per cent. This means better delivery times for customers and some openings on the books for others who haven't been able to satisfy their requirements elsewhere.

Even if the industry should fall short of the 100 per cent mark, this will still be a record year. Through April, American Iron & Steel Institute figures show shipments of plates 21.7 per cent ahead of those in the corresponding period last year. Structurals were 21.9 per cent ahead. While producers feel that the construction and heavy machinery markets are down this year, compared with last, figures show that shipments to those industries were running ahead during the first quarter: Construction —18.5 per cent for plates, 22.1 per cent for structurals. Heavy machinery—13.4 per cent for plates and 12.2 per cent for structurals. The other principal markets are ahead of those a year ago (first quarter comparisons):

	Plates	Structurals
Roadbuilding	31.2%	25.6%
Shipbuilding	38.5%	32.8%
Railroads	23.8%	44.0%

Regardless of the production rate, shipments during the second half will be better than those in

last year's second half, mainly because the industry lost six weeks of production during last year's steelworkers' strike. Says one producer: "There won't be sufficient slackening in demand during the second half to offset the advantage we have over the last third quarter. In fact, total demand will be off only to the extent that strip plate slips."

Balance Coming—The prospects for a balance in both heavy plates and structurals within the foreseeable future are good, industry spokesmen think. Bethlehem Steel Co., one of the largest producers, thinks this may be a fact by the end of this year. One midwest producer looks for it before mid-1958. Most think it will come about the turn of 1960 when the planned expansion will be nearly complete. Some steelmen even feel there may be an excess of capacity by then. "From now on, we will have our temporary shortages or surpluses just like any other steel producer," declares one spokesman. "But we're through with the feast or famine days."

Plates . . .

Plate Prices, Page 139

Plate fabricators will pay more for their supplies of plates this quarter. Led by U.S. Steel Corp.'s operating divisions, producers advanced prices July 1. Carbon plates went up $5 a ton, high-strength low-alloy $7.50, and alloy $7.

Lukens Steel Co., Coatesville, Pa., made no immediate change on its high-strength low-alloy plates, or clad plates. The Claymont plant of Colorado Fuel & Iron Corp. held its carbon plate price at $5.70 per 100 lb. This was established last December. It did increase carbon extras, and raised prices on high-strength low alloy and carbon plates.

Some plate mills are not booked full for the third quarter on wide and heavy gage material. Caution in booking for midsummer rolling rather than lack of demand is responsible. Interest in light plates perked up at Pittsburgh as the second quarter ended. Demand had been slipping in recent weeks as supplies from the continuous mills gained. One Chi-

Here are our published performance specifications for Federated Tenzaloy: Castings aged 10-14 days at room temperature.

Tensile strength	35,000 psi
Yield strength	25,000 psi
Elongation (in 2 in.)	4-5%
Brinell Hardness No.	74
Impact strength (Charpy in ft.-lbs.)	
Notched	3
Unnotched	14
Electrical Conductivity	35%

Federated products:

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Federated Tenzaloy is the most widely used of all high-strength, self-aging aluminum alloys because it has the highest yield strength, and it has the best all-around combination of properties. Yield strength is the true measure of a metal's ability to take punishment, regardless of other claims that are made.

When you buy Federated Tenzaloy, you can be sure it will perform as well as its specifications indicate. Tenzaloy is produced under the strictest quality-control procedures, developed by ASARCO's Central Research Laboratory, where refining and testing techniques control impurities to parts per million, if required.

Hundreds of foundries and manufacturers use Tenzaloy when castings with superior properties are desired — and to replace ordinary alloys which require additional operations to meet required properties.

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cago area producer reports its July bookings were larger than had been expected.

Wire . . .

Wire Prices, Pages 141 & 142

U.S. Steel Corp. and its operating divisions, American Steel & Wire, Tennessee Coal & Iron and Columbia-Geneva, raised prices on wire and wire products July 1 to offset automatic wage increases that became effective that date. Other wiremakers indicate they are taking similar action.

Under the new U.S. Steel schedule, wire rods are up $7 a ton; manufacturers wire, $7; premier spring wire (high carbon), $12; MB spring wire, $5.50; merchant quality wire, $7. Other wire items are up correspondingly.

Manufactuers of many finished products fabricated from steel wire (screws and other fasteners, springs and numerous formed items) are skeptical of their ability to pass on fully to their customers the increase in wire prices. This is the second advance on some wire products this year, base prices and extras being raised about $8 a ton in first quarter. All of the earlier increase was not passed along.

Competition from imported products is a factor working against higher prices on many finished products made of wire, including nails. One Pittsburgh area nailmaker may close its plant early this quarter for lack of sales volume.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 140 & 141

Sheetmakers anticipate a rebound in business next month. Some of them say they already have more August shipment business than July shipment business on their books. August deliveries should easily surpass the July movement, in the opinion of most market interests. Some mills can still work in tonnage for shipment this month.

There are scattered indications that the automakers are beginning to show more interest in cold-rolled sheets. Heavy pickup in ordering, though, is not likely to develop before next month. Ordering by appliance makers has been

cut back. Silicon sheet sales to appliance makers declined last month and they continue to slip. The only firm market at present for silicon sheets appears to be in demand from makers of power generators.

Impact of the higher prices on demand remains to be determined. Indications are all leading producers are following the lead of U.S. Steel's operating divisions in raising prices, effective July 1, to offset the wage increase that was applied automatically in the industry on that date.

Under the new price schedule, cold-rolled sheets are up $6 a ton; hot-rolled sheets and strip, $5; enameling sheets, $6; galvanized sheets, $6; long ternes, $6.

Shipments of steel shipping barrels and drums in April of 3,035,077 units about equaled the March movement, and were 9 per cent below shipments in April, 1956, reports the U.S. Bureau of the Census. Shipments for the first four months totaled 11,969,443 units, compared with 12,568,351 in the corresponding period of last year.

April shipments of 6,553,771 steel shipping pails were 6 per cent above the March total, but 7 per cent below April of last year. Total shipments for the first four months of 24,240,229 shipping pails were down from 26,004,625 in the same period last year.

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Now equipped with a new and larger Onan 12.9 hp engine, the new Miller AEA-200-L produces a full 225 amperes of continuous rated, high cycle welding current or, 5 KW of 110/220 ac power for operation of power tools, lights, milking machines, etc., or, 1 KW of dc power.
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Fasteners . . .

Bolt, Nut, Rivet Prices, Page 142

Production of industrial fasteners will be curtailed somewhat over the next several weeks because of vacation shutdowns. Some makers are staggering vacations and will operate steadily this month. Others are closing for two weeks.

Most Pittsburgh area producers are operating full schedules. But the Coraopolis, Pa., plant of Russell, Burdsall & Ward Bolt & Nut Co. is closed for two weeks.

Steel Bars . . .

Bar Prices, Page 139

Although July is well under way, some producers of hot carbon bars still are able to work some tonnage into their schedules for delivery before the end of the month. Inquiry continues to lag. Sellers anticipate little pickup in demand before mid-August. By that time, there should be a livelier interest on the part of the automotive and related industries. Also, there may be a broadening of interest in fourth quarter requirements.

Sellers of cold-finished bars have a good assortment of specifications in stock and can provide early shipments on a variety of requirements.

The decline in demand for leaded steel bars (carbon and alloy) is less apparent than in other grades in New England. Limited production capacity in the area is one reason. Cold-finishing of this grade at Hartford, Conn., will be supplemented by other producers. American Steel & Wire Division, U.S. Steel Corp., is rolling leaded bars in the Midwest and one of the largest eastern mills is considering entering the field.

Most cold-drawn bar mills in the Pittsburgh area are closed for

vacations. Some of these producers reported a slight spurt in orders late in June, largely from customers seeking to beat the July 1 price increase. No major improvement in demand is expected until late August or early September.

Effective July 1, prices were advanced by the leading producers to offset the automatic increase in wages effective that date. Hot-rolled bars went up $7 a ton.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 139

Over-all demand for reinforcing steel is expected to hold up well through the second half of the year, but some areas (New England, for example) think bars will move more sluggishly, except for school and similar public construction.

Most distributors of sheared and deformed bars in New England have substantial backlogs and the mills are shipping tonnage promptly. Competitive selling, though, involves both prices and deliveries. Contractors are shopping for bar tonnage on a price basis and are reluctant to pay higher.

The U.S. Steel Corp. and its operating divisions raised prices $7 a ton on reinforcing bars, effective July 1. Other makers indicated they would take similar action to offset the automatic wage increase that went into effect July 1 under the terms of the 1956 steel wage settlement.

Lone Star Steel Co., Dallas, will install a bar mill as part of its $8-million expansion program. The company plans to reheat the skelp trim from its tube mill and roll the material into ⅜ and ½-in. reinforcing bars. Production should start in 1958.

Texas facilities currently have annual re-bar capacity of 162,050 tons, according to the American Iron & Steel Institute.

Rails, Cars . . .

Track Material Prices, Page 142

Shipments of steel to the railroads have been fairly good all year, but the carriers are beginning to order with a bit of caution—a condition that usually prevails when their carloadings decrease.

Sales of wheels and axles as a support to building of new freight cars and repair of old ones are good.

Tubular Goods . . .

Tubular Goods Prices, Page 143

Sales of several tubular products have begun to decline. Seamless specialties sales dropped as the result of large consumer inventories. Buttweld pipe is selling below capacity of the producers.

Oil country tubular products outlook continues bright. The large backlog of unfilled orders for drill pipe, tubing and casing could cause renewed tightness in the market in fourth quarter—normally one of the busiest periods of the year.

Effective July 1, the U.S. Steel Corp. and its operating subsidiaries advanced prices on tubular goods from $6.50 to $15.50 a ton.

Buttweld standard and line pipe (black and galvanized) went up

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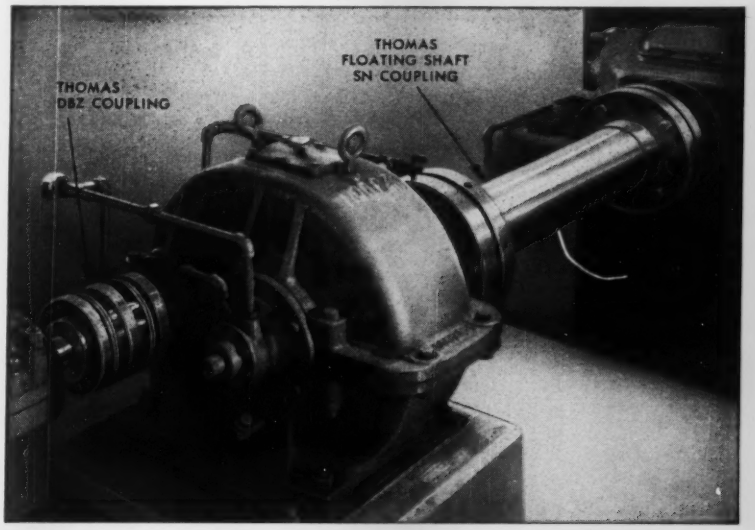

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Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.

They will protect your equipment and extend the life of your machines.

Properly installed and operated within rated conditions, Thomas Couplings should last a lifetime.

Under Load and Misalignment only Thomas Flexible Couplings offer all these advantages:

1 Freedom from Backlash Torsional Rigidity
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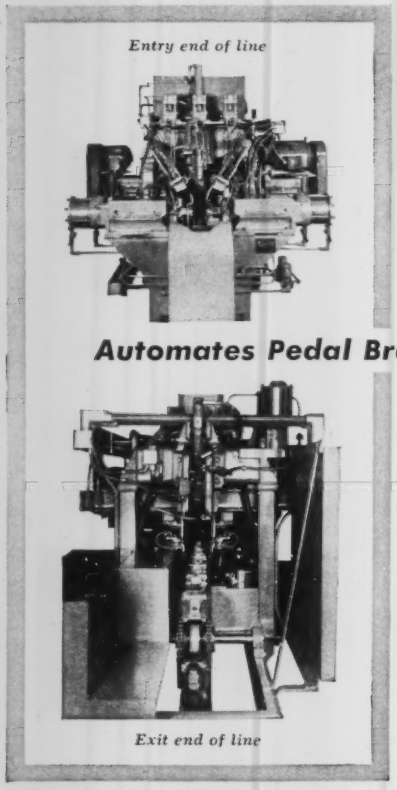

Federal

PACKAGED PRODUCTION LINE

Automates Pedal Bracket Manufacture for Dodge!

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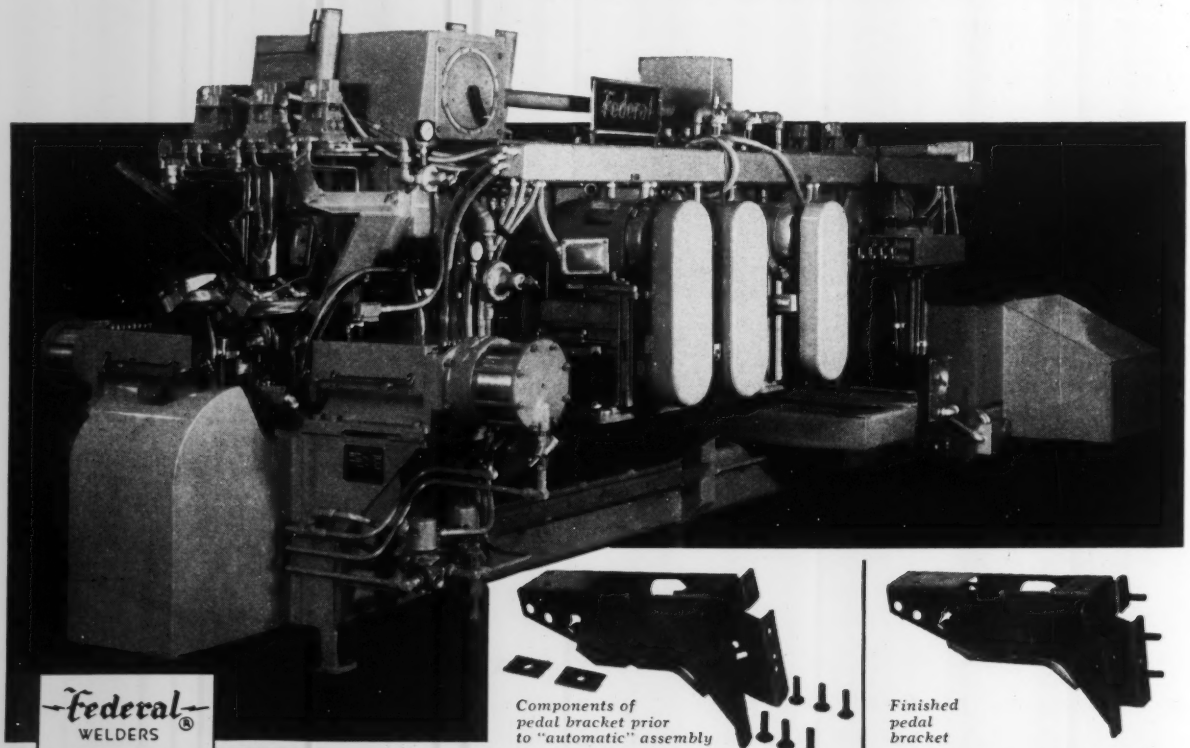
The Dodge Division of the Chrysler Corporation recently set into operation a single Federal machine that performs manufacturing functions normally requiring many separate pieces of equipment. In the fabrication of automotive pedal brackets this Federal "Packaged Production Line" was made to feed and weld two pads to the bracket, spot face one pad, ream and de-burr holes in each pad, feed and weld six mounting bolts and eject the finished piece at a rate of 775 units per hour.

The combining of several manufacturing operations into one has many natural advantages. It means one source responsibility, reduced floor space, and handling requirements, equipment economies and greater product uniformity.

Don't overlook these benefits—talk with Federal—a pioneer in the development and manufacture of "Packaged Production Lines."



Components of pedal bracket prior to "automatic" assembly

Finished pedal bracket

Federal WELDERS®

Warco PRESSES®

The Federal Machine and Welder Company

225

WARREN, OHIO

$8; seamless standard and line pipe (black and galvanized) $8; electricweld line pipe, 24-in. OD $8; seamless and electricweld line pipe, 26 to 36-in. OD, $6.50; oil country casing, grade J-55, $9.50; oil country tubing, grade J-55, $10.25; drill pipe, $15.50; seamless pressure and mechanical tubing (carbon), approximately 5.5 per cent; seamless pressure tubing (alloy), 4.5 per cent.

Warehouse . . .

Warehouse Prices, Page 144

Steel warehouse operators are studying the new mill price lists, seeking to determine the impact on their own schedules. The distributors will advance their quotations, probably within the next week or so, action being delayed until detailed information is available with respect to the mill schedules.

Demand on the warehouses is slower, except for a slight spurt in orders here and there toward the end of June. Tonnage sales in the New England area are reported 5 to 10 per cent off from a year ago, chiefly in alloys. In dollar volume, sales are about equal to last year's as the result of higher prices this year.

Structural Shapes . . .

Structural Shape Prices, Page 139

Structural steel shipments reached a new record in May at 329,626 tons, reports the American Institute of Steel Construction. The new peak reflected the increasing supply of structural shapes available to fabricators.

Bookings dropped below the year's high set in April, totaling 291,750 tons, bringing the five-month total to 1,504,727 tons, against 1,839,618 in the corresponding period of 1956. The May decline, and the five-month cumulative total, represented a drop of 18 per cent from a year ago.

May shipments were 8 per cent above deliveries in May, 1956, and brought the total for the first five months to 1,488,856 tons, an increase of 3 per cent over the 1,439,477 in the same period last year.

Backlogs as of May 31 were 3,416,986 tons, virtually unchanged from April. During the following

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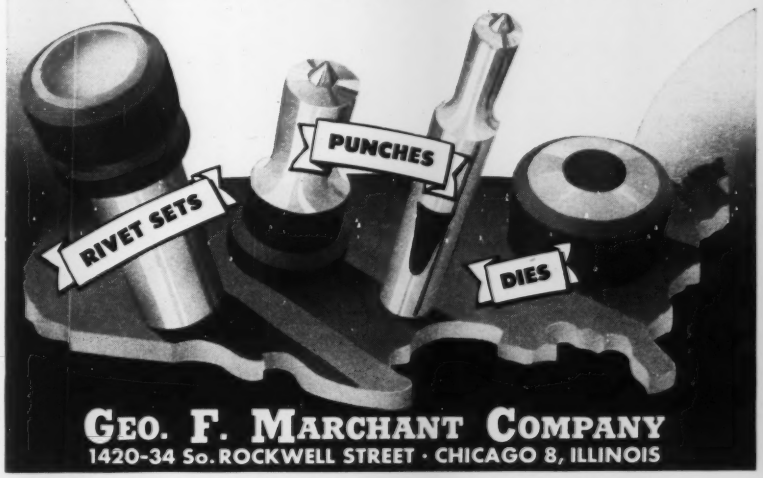
Punches, Dies, Rivet Sets, "Heatproof" Compression Dies.

Round, square, oblong Punches, Dies and Rivet Sets carried in stock.

Write Dept. A for catalog 54 and new stock list.



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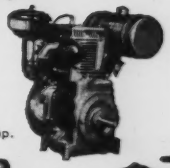
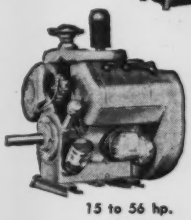
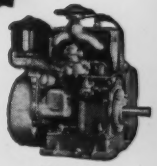

6 to 9 hp.


15 to 56 hp.


10 to 18 hp.

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four months about 1,350,000 tons were scheduled for fabrication.

Only supply of wide flange beams remains tight. Fabricators are getting mill shipments more nearly on schedule, though warehouse allotments are unchanged.

Less fabricated structural tonnage is being estimated. Shipments exceed new bookings, but not by a large margin, especially with shops on bridge work.

Structural steel prices went up July 1 to reflect the automatic increase in steel wages that went into effect that date. U.S. Steel's operating divisions led the mark-up. Other makers are following. Under the new schedule, standard structurals are quoted $5.50 a ton higher, as are bearing piles. Sheet piling is up $6.50.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2140 tons, 22-story office building, northeast corner, Lexington avenue and 40th street, New York, to Grand Iron Works, New York; Emery & Roth & Sons, architect.

1050 tons, structurals and bars, buildings, Northeastern Florida State Mental Hospital, McClenny, Fla., to Plowden & Co., Atlanta, Ga. (structurals), and Florida Steel Products (reinforcing bars).

900 tons, state bridge work, route 21, Essex county, New Jersey, through Franklin Contracting Co. to Phoenix Bridge Co., Phoenixville, Pa.

850 tons, state highway structures, including 420-ft steel beam bridge, Patpasco river, near Lithicom, Md., to Phoenix Bridge Co., Phoenixville, Pa. (structurals) and Bethlehem Steel Co., Bethlehem, Pa. (reinforcing bars); McLean Contracting Co., Baltimore, general contractor.

850 tons, ready hangar and shelters, AFB, Niagara Falls, N. Y., to White Plains Iron Works, Peekskill, N. Y.; awarded by Corps of Engineers, New York.

500 tons, bridge crane for Ice Harbor power project, to Milwaukee Crane Division, Industrial Enterprises, Cudahy, Wis., low at $374,255, to U.S. Engineer, Walla Walla, Wash.

290 tons, Coast Guard hangar, Anchorage, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Pacific-Alaska Contractors Inc., Tacoma, Wash., general contractor, low at $910,668. Bethlehem also booked 40 tons for a plant addition at Arco, Idaho, for Atomic Energy Commission.

265 tons, bridge relocation, U.S.-127 over New York Central railroad, near Jackson, Mich., to Bethlehem Steel Co., Bethlehem, Pa.

220 tons, two ocean going tugs, to Todd Shipyards Corp., Seattle.

207 tons, two gantry cranes, early 1958 delivery, to Todd Shipyards Corp., Seattle.

185 tons, warehouse, American Can Co., Milwaukee, to an unnamed fabricator.

145 tons, two state bridges, Winchester, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; White Oak Excavators Inc., Plainville, Conn., general contractor.

105 tons, bridge relocation, U.S.-127, near Jackson, Mich., to Bethlehem Steel Co., Bethlehem, Pa.

110 tons, state highway bridge, Fall River expressway, Randolph, Mass., to Tower Iron Works, Province, R. I.; Old Colony Construction Co., Quincy, Mass., general contractor.

STRUCTURAL STEEL PENDING

3315 tons, including 1805 tons of low alloy, superstructure, steel girder bridge, Anacostia freeway over P.B. & W. railroad yards, contract 2, Washington, D.C.; Terry Contracting Co., New York, low at $2,575,898.67.

665 tons, mostly angles, General Stores Supply Office, Navy, Philadelphia.

415 tons, three state bridges, Nos. 518, 519 and 520, Kent county, Rhode Island.

180 tons, steel sheet piling, water cutoff for bridge and spillway, Easthampton, Mass.

150 tons, state bridge work, Westmoreland county, Pennsylvania; bids July 26.

Blast Furnace Production—May, 1957

(Net tons)

Districts	Pig Iron—Current Month	Pig Iron—Year To Date	Ferroalloys—Current Month	Ferroalloys—Year To Date
Eastern	1,459,490	7,145,903	32,723	170,630
Pittsburgh-Youngstown	2,295,167	12,051,180	22,615	99,233
Cleveland-Detroit	842,135	4,183,321	.....	.....
Chicago	1,361,312	7,026,278	.....	.....
Southern	571,657	2,548,735	10,228	59,065
Western	350,120	1,717,743	.....	.....
Total	6,879,881	34,673,160	65,566	328,928

Imported Steel

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅜" Dia. incl. all extras)	$7.13	$7.36	$7.02	$6.76
Merchant Bars (¼" Round incl. all extras)	7.67	7.90	7.53	7.27
Bands (1"x¼"x20' incl. all extras)	7.81	8.03	7.70	7.43
Angles (2"x2"x¼" incl. all extras)	6.77	7.00	7.21	6.93
Beams & Channels (base)	7.17	7.41	7.87	7.45
Furring Channels (C.R. ¾", per 1000')	26.62	27.77	32.77	31.80
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.38	8.58	9.07	8.99
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's, bright, low C, (11½ ga.)	7.38	7.52	8.52	8.52
Wire, galvanized, low C, (11½ ga.)	8.01	8.15	9.42	9.42
Wire, Merchant quality, bl. ann., (10 ga.)	7.60	7.75	8.78	8.78
Rope Wire (.045", 247,000 PSI, incl. extras)	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14G, 97 lbs. net)	9.58	9.73	9.64	9.64
Merchant Pipe (½" galv. T & C, per 100')	8.64	9.11	...	...
Casing (5½", 15.5 J55, T & C, per 100')	194.00	199.00	...	...
Tubing (2⅜", 6.4 J55, EUE, per 100')	103.00	104.00	...	...
Forged R. Turn. Bars, C-1035 (from 10" dl.)	14.00	14.23	14.00	13.74

Ask prices on: Bulb tees, bolts and nuts, coated and specialty strip, welded wire reinforcing mesh and hardware cloth, boiler tubes, API line pipe, A-335-P11 pressure pipe.

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REINFORCING BARS . . .

REINFORCING BARS PLACED

300 tons, hospital addition, Bellingham, Wash., to Joseph T. Ryerson & Son Inc., Seattle; Elford Construction Co., Bellingham, general contractor.

300 tons, bridge and approaches, U.S. 74, Anson-Richmond counties, North Carolina, to Virginia Steel Co., Richmond, Va.; Bowers Construction Co., Raleigh, N.C., general contractor; superstructure precast, prestressed concrete beams, Concrete Materials Inc., Charlotte, N. C.

100 tons, dormitory, Radcliffe College, Cambridge, Mass., to U.S. Steel Supply Division, U.S. Steel Corp., Boston; McCutcheon Co., Boston, general contractor; 75 tons of fabricated structural steel, A. O. Wilson Structural Co., Cambridge, Mass.

270 tons, state freeway, Pierce county, Washington, to J. D. English Steel Co., Tacoma, Wash.; Woodworth & Co., Tacoma, general contractor.

125 tons, bridge and viaduct, Thomaston, Conn., to Truscon Steel Division, Republic Steel Corp., Boston; Onegila & Gervasini Inc., Torrington, Conn., general contractor.

PLATES . . .

PLATES PLACED

100 tons, water tank, Kent, Wash., to Pittsburgh-Des Moines Steel Co., Seattle.

PLATES PENDING

380 tons, river buoys (1170), 3/6-in. low carbon plate, electric or gas welded; bids July 9, Second Coast Guard District, St. Louis; also 170 tons, No. 12 gage sheet and 235 tons, No. 18 gage sheet, for lighter buoys.

200 tons, water system, McChord Air Field, Tacoma, Wash.; Milone & Tucci, Tacoma, Wash., low at $344,434 to U.S. Engineer.

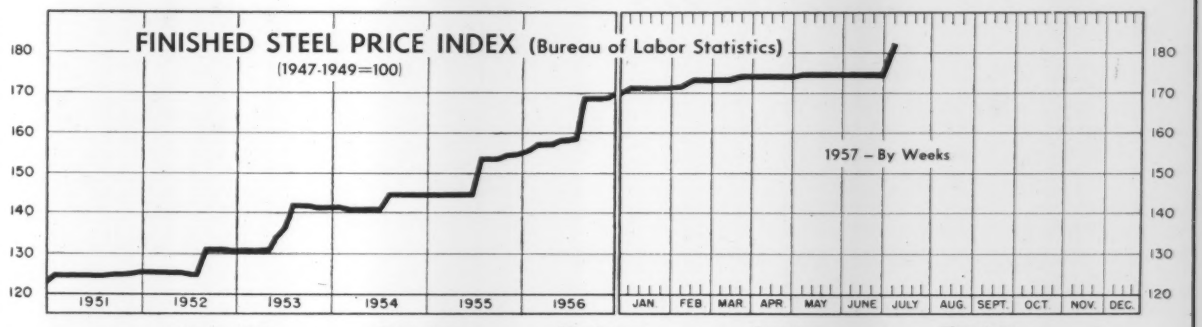
200 tons, standpipe, Salem, Oreg.; American Pipe & Construction Co., Portland, Oreg., low at $68,000.

185 tons, including 80 tons of corrosion resisting, General Stores Supply Office, Navy, Philadelphia.

110 tons, fuel storage tanks, Sheppard AFB; bids July 24, Corps of Engineers, Tulsa, Okla.

100 tons, radar installation, Montana; bids to U.S. Engineer, Seattle, July 2.

Price Indexes and Composites



July 2, 1957	Week Ago	Month Ago	June Avg.	Year Ago
182.0†	174.3	174.3	174.3	158.2

†Preliminary.

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 2

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.350
Rails, Light, 40 lb	6.817
Tie Plates	6.275
Axles, Railway	9.400
Wheels, Freight Car, 33 in. (per wheel)	57.50
Plates, Carbon	5.900
Structural Shapes	5.667
Bars, Tool Steel, Carbon (lb)	0.480
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.585
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769
Bars, H.R., Alloy	10.150
Bars, H.R., Stainless, 303 (lb)	0.508
Bars, H.R., Carbon	6.075
Bars, Reinforcing	5.788
Bars, C.F., Carbon	9.910
Bars, C.F., Alloy	13.425
Bars, C.F., Stainless, 302 (lb)	0.533
Sheets, H.R., Carbon	5.942
Sheets, C.R., Carbon	6.789
Sheets, Galvanized	7.990
Sheets, C.R., Stainless, 302 (lb)	0.660
Sheets, Electrical	11.225
Strip, C.R., Carbon	8.843
Strip, C.R., Stainless, 430 (lb)	0.475
Strip, H.R., Carbon	5.995
Pipe, Black, Buttweld (100 ft)	18.894
Pipe, Galv., Buttweld (100 ft)	22.344
Pipe, Line (100 ft)	190.108
Casing, Oil Well, Carbon (100 ft)	185.565
Casing, Oil Well, Alloy (100 ft)	290.203
Tubes, Boiler (100 ft)	46.737
Tubing, Mechanical, Carbon (100 ft)	23.713
Tubing, Mechanical, Stainless, 304 (100 ft)	197.663
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
Black Plate, Canmaking Quality (95 lb base bcx)	7.583
Wire, Drawn, Carbon	9.775
Wire, Drawn, Stainless, 430 (lb)	0.630
Bale Ties (bundle)	7.423
Nails, Wire, 8d Common	9.365
Wire, Barbed (80-rod spool)	8.327
Woven Wire Fence (20-rod roll)	20.560

STEEL's FINISHED STEEL PRICE INDEX*

	July 2 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	228.59	228.59	210.45	171.92
Index in cents per lb	6.479	6.193	6.193	5.701	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$145.74	$140.24	$140.24	$128.98	$106.32
No. 2 Fdry Pig Iron, GT	64.70	64.70	64.70	60.56	52.54
Basic Pig Iron, GT	64.23	64.23	64.23	59.80	52.16
Malleable Pig Iron, GT	65.77	65.77	65.77	61.27	53.27
Steelmaking Scrap, GT	55.33	55.83	52.33	45.83	42.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	July 2 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.425	5.075	5.075	4.65	3.70
Bars, H.R., deld., Philadelphia	5.715	5.365	5.365	4.93	4.252
Bars, C.F., Pittsburgh	7.30*	6.85*	6.85*	6.25*	4.55
Shapes, Std., Pittsburgh	5.275	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.275	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.585	5.31	5.31	5.00	3.93
Plates, Pittsburgh	5.10	4.85	4.85	4.50	3.70
Plates, Chicago	5.10	4.85	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.50	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	5.10	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.15
Sheets, H.R., Pittsburgh	4.925	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.925	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	6.05	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	6.05	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.60	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.925	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.925	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	7.15	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	7.15	6.85	6.85	6.25-6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.65	7.20	7.20	6.60	4.85-5.10
Nails, Wire, Pittsburgh	8.95	8.49	8.49	7.60	5.90-6.20
Tin plate(1.50 lb)box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.70

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$91.50	$91.50	$84.50	$66.00
Wire rods, 7/32-5/8" Pitts.	6.15	5.80	5.80	5.375	4.10-4.30

PIG IRON, Gross Ton	July 2 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$65.50	$65.50	$65.50	$61.00	$53.00
Basic, Valley	64.50	64.50	64.50	60.00	52.00
Basic, deld., Phila.	68.38	68.38	68.38	63.76	56.75
No. 2 Fdry, NevilleIsland, Pa.	65.00	65.00	65.00	60.50	52.50
No. 2 Fdry, Chicago	65.00	65.00	65.00	60.50	52.50
No. 2 Fdry, deld., Phila.	68.88	68.88	68.88	64.26	57.25
No. 2 Fdry, Birm.	59.00	59.00	59.00	57.00	48.88
No. 2 Fdry(Birm.)deld.Cin.	66.70	66.70	66.70	62.70	56.43
Malleable, Valley	65.00	65.00	65.00	60.50	52.50
Malleable, Chicago	65.00	65.00	65.00	60.50	52.50
Ferromanganese, Duquesne	255.00†	255.00†	255.00†	215.00†	188.00*

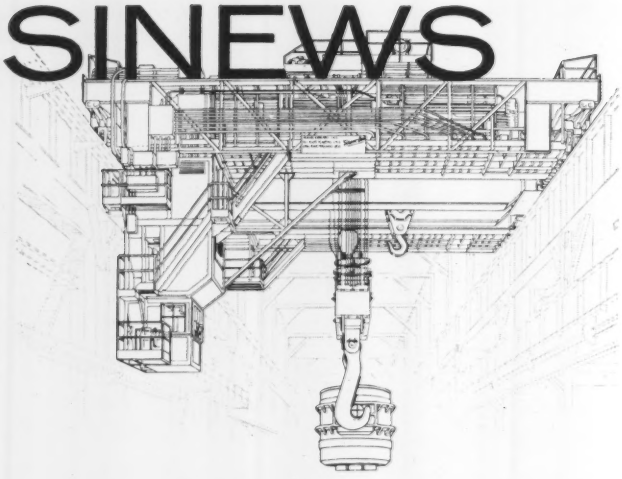
†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$56.50	$57.50	$51.00	$44.50	$44.00
No. 1 Heavy Melt, E. Pa.	56.00	56.50	56.50	47.00	40.50
No. 1 Heavy Melt, Chicago	53.50	53.50	49.50	46.00	42.50
No. 1 Heavy Melt, Valley	54.50	54.50	52.50	44.50	44.00
No. 1 Heavy Melt, Cleve.	51.50	51.50	49.50	42.50	43.00
No. 1 Heavy Melt, Buffalo	46.50	46.50	40.50	42.50	37.00
Rails, Rerolling, Chicago	74.50	74.50	62.50	66.50	52.50
No. 1 Cast, Chicago	47.50	47.50	46.50	45.50	45.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$14.125	$14.75
Beehive, Fdry., Connlsvl.	18.00	18.00	18.00	16.50	17.50

STEEL SINEWS

GIVE STEEL A LIFT

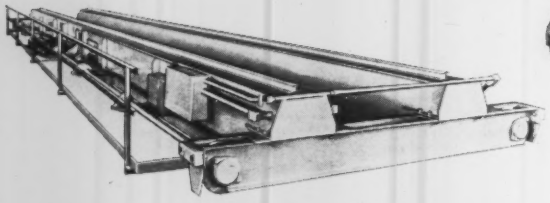


In the dark of night, steel-making centers are bathed in a vivid glow that symbolizes the might of the industry. Unseen by most eyes are the powerful cranes that handle the vast daily tonnage. To design and build the many types and capacities needed frequently requires specialized crane engineering talents and huge manufacturing resources. That is why this giant ladle crane is a product of "Shaw-Box". It is a 4-girder, double trolley crane with 9 motors and a 54-foot span. The 90-ton ladle carries a 200-ton load of molten steel. A 75-ton auxiliary trolley, also a part of the unit, operates independently for handling lighter loads. Control is so fine, the 290-ton loads are handled with the utmost precision and safety.

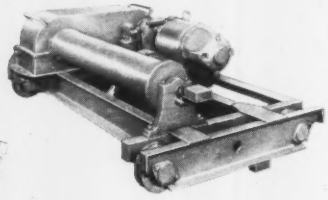
"Shaw-Box" has been building general and special purpose cranes for nearly three-quarters of a century. Whether a crane is needed for an atomic energy project, a warehouse, a locomotive repair shop, a shipyard or a metal-working plant, "Shaw-Box" can satisfy the most exacting requirements. We introduced numerous crane innovations that are now the acknowledged standard. The first multi-motored crane was designed by "Shaw-Box".

We recently developed 5 to 20-ton Type "SC" general-purpose cranes with such highly standardized components that the cost of special engineering is largely avoided, thus reducing the buyer's investment. Another notable achievement is a line of hydraulic cranes which utilizes only one electric motor to perform all the functions of a standard crane. Built in capacities to 10-tons, these cranes use little electricity and provide unusually fine positioning characteristics.

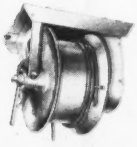
Whether your problem is to lift and transport a few thousand pounds or hundreds of tons, turn to "Shaw-Box" for a practical solution. Our crane engineers will gladly work with yours to make certain performance, safety and economy surpass expectations. We invite your inquiry.



Typical Type "SC" Crane Bridge. Note the double web box section girders. No whipping or skewing even under the severest conditions. Direct drive bridge machinery has anti-friction bearings, gearing that operates in oil, and rotating wheel axles for smooth operation and longer life.



The Type "SC" Trolley has a higher hook lift than other unmodified standard top-running trolleys. It provides true vertical lift. The hoist mechanism is precision built for long, quiet operation and little maintenance. Two brakes hold and control the load safely.



"Shaw-Box" Cable Reel. A rugged, efficient mechanism that automatically keeps insulated conductor cable taut on crane and hoist magnets, on soaking pit carriages, mill machinery and machine tools. Spring cannot break.

57E-7

MANNING MAXWELL & MOORE INC. TRADE MARK

"Shaw-Box"® CRANES

MANNING, MAXWELL & MOORE, INC.

SHAW-BOX CRANE & HOIST DIVISION

384 West Broadway • Muskegon, Michigan

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

In Canada: Manning, Maxwell & Moore of Canada, Ltd., Avenue Road, Galt, Ontario.

Steel Prices

Mill prices as reported to STEEL, July 3, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 140; to footnotes, page 142.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $70.50

INGOTS, Alloy (NT)
Detroit S41 ..... $74.00
Midland,Pa. C18 ..... 74.00
Munhall,Pa. U5 ..... 77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ..... $77.50
Bridgeport,Conn. N19 .. 79.00
Buffalo R2 ..... 77.50
Clairton,Pa. U5 ..... 77.50
Ensley,Ala. T2 ..... 77.50
Fairfield,Ala. T2 ..... 77.50
Fontana,Calif. K1 .... 83.50
Gary,Ind. U5 ..... 77.50
Johnstown,Pa. B2 ..... 77.50
Lackawanna,N.Y. B2 .. 77.50
LoneStar,Tex. L6 .... 80.00
Munhall,Pa. U5 ..... 77.50
S.Chicago,Ill. R2, U5 .. 77.50
S.Duquesne,Pa. U5 .... 77.50
Sterling,Ill. N15 ..... 74.00
Youngstown R2 ..... 77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $96.00
Bridgeport,Conn. N19 .. 96.50
Buffalo R2 ..... 96.00
Canton,O. R2 ..... 96.00
Clairton,Pa. U5 ..... 96.00
Conshohocken,Pa. A3 .. 101.00
Ensley, Ala. T2 ..... 96.00
Fairfield,Ala. T2 ..... 96.00
Fontana,Calif. K1 .... 101.00
Gary,Ind. U5 ..... 96.00
Geneva,Utah C11 ..... 96.00
Houston S5 ..... 96.50
Johnstown,Pa. B2 ..... 96.00
Lackawanna,N.Y. B2 .. 96.00
LosAngeles B3 ..... 101.00
Midland,Pa. C18 ..... 91.50
Munhall,Pa. U5 ..... 96.00
Seattle B3 ..... 105.00
S.Chicago R2, U5, W14 96.00
S.Duquesne,Pa. U5 .... 96.00
S SanFrancisco B3 ... 101.00
Warren,O. C17 ..... 96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 .... $114.00
Bridgeport,Conn. N19 .. 107.00
Buffalo R2 ..... 114.00
Canton,O. R2 T7 ..... 114.00
Conshohocken,Pa. A3 .. 121.00
Detroit S41 ..... 107.00
Fontana,Calif. K1 ... 128.00
Gary,Ind. U5 ..... 114.00
Houston S5 ..... 112.00
Ind.Harbor,Ind. Y1 ... 114.00
Johnstown,Pa. B2 ..... 114.00
Lackawanna,N.Y. B2 .. 114.00
LosAngeles B3 ..... 127.00
Massillon,O. R2 ..... 114.00
Midland,Pa. C18 .... 107.00
Munhall,Pa. U5 ..... 114.00
S.Chicago R2, U5, W14 114.00
S.Duquesne,Pa. U5 .... 114.00
Struthers,O. Y1 ..... 114.00
Warren,O. C17 ..... 114.00

ROUNDS, SEAMLESS TUBE (NT)
Bridgeport,Conn. N19 $116.50
Buffao R2 ..... 117.50
Canton,O. R2 ..... 117.50
Cleveland,O. R2 ..... 117.50
Gary,Ind. U5 ..... 117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 .... 117.50
Warren,O. C17 ..... 117.50

SKELP
Aliquippa,Pa. J5 ..... 4.725
LoneStar,Tex. L6 ..... 5.025
Munhall,Pa. U5 ..... 4.875
Warren,O. R2 ..... 4.875
Youngstown R2, U5 .... 4.875

WIRE RODS
AlabamaCity,Ala. R2 .... 6.15
Aliquippa,Pa. J5 ..... 5.80
Alton,Ill. L1 ..... 6.00
Buffalo W12 ..... 5.80
Cleveland A7 ..... 6.15
Donora,Pa. A7 ..... 6.15
Fairfield,Ala. T2 ..... 6.15
Houston S5 ..... 6.05
IndianaHarbor,Ind. Y1 .. 6.15
Johnstown,Pa. B2 ..... 5.80
Joliet,Ill. A7 ..... 6.15
KansasCity,Mo. S5 ..... 6.05
Kokomo,Ind. C16 ..... 5.90
LosAngeles B3 ..... 6.60
Minnequa,Colo. C10 .... 6.05
Monessen,Pa. P17 ..... 5.80
N.Tonawanda,N.Y. B11.. 5.80
Pittsburg,Calif. C11 .... 6.95
Portsmouth,O. P12 .... 5.80
Roebling,N.J. R5 ..... 5.90
S.Chicago,Ill. R2 ..... 6.15
SparrowsPoint,Md. B2 .. 5.90
Sterling,Ill.(1) N15 ..... 6.15
Sterling,Ill. N15 ..... 6.25
Struthers,O. Y1 ..... 6.15
Worcester,Mass. A7 ..... 6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 ..... 5.275
Atlanta A11 ..... 5.20
Aliquippa,Pa. J5 ..... 5.00
Bessemer,Ala. T2 ..... 5.275
Bethlehem,Pa. B2 ..... 5.325
Birmingham C15 ..... 5.00
Clairton,Pa. U5 ..... 5.275
Fairfield,Ala. T2 ..... 5.275
Fontana,Calif. K1 ..... 5.75
Gary,Ind. U5 ..... 5.275
Geneva,Utah C11 ..... 5.275
Houston S5 ..... 5.10
Ind.Harbor,Ind. I-2 ..... 5.275
Johnstown,Pa. B2 ..... 5.325
Joliet,Ill. P22 ..... 5.275
KansasCity,Mo. S5 ..... 5.10
Lackawanna,N.Y. B2 ..... 5.325
LosAngeles B3 ..... 5.70
Minnequa,Colo. C10 .... 5.30
Munhall,Pa. U5 ..... 5.275
Niles,Calif. P1 ..... 5.65
Phoenixville,Pa. P4 .... 5.85
Portland,Oreg. O4 ..... 5.75
Seattle B3 ..... 5.75
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ..... 5.65
Sterling,Ill. N15 ..... 5.275
Torrance,Calif. C11 ..... 5.975
Weirton,W.Va. W6 ..... 5.00

Wide Flange
Bethlehem,Pa. B2 ..... 5.325
Clairton,Pa. U5 ..... 5.275
Fontana,Calif. K1 ..... 5.90
IndianaHarbor,Ind. I-2 .. 5.525
Lackawanna,N.Y. B2 ..... 5.325
Munhall,Pa. U5 ..... 5.275
Phoenixville,Pa. P4 .... 5.85
S.Chicago,Ill. U5 ..... 5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.20
Clairton,Pa. U5 ..... 6.20
Gary,Ind. U5 ..... 6.20
Houston S5 ..... 6.30
Munhall,Pa. U5 ..... 6.20
S.Chicago,Ill. U5 ..... 6.20

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ..... 7.35
Bessemer,Ala. T2 ..... 7.75
Bethlehem,Pa. B2 ..... 7.80
Clairton,Pa. U5 ..... 7.75
Fairfield,Ala. T2 ..... 7.75
Fontana,Calif. K1 ..... 8.10
Gary,Ind. U5 ..... 7.75
Geneva,Utah C11 ..... 7.35
Houston S5 ..... 7.45
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 ..... 7.80
KansasCity,Mo. S5 ..... 7.45
Lackawanna,N.Y. B2 ..... 7.80
LosAngeles B3 ..... 8.05
Munhall,Pa. U5 ..... 7.75
Seattle B3 ..... 8.10
S.Chicago,Ill. U5, W14 7.75
S.SanFrancisco B3 ..... 8.00
Struthers,O. Y1 ..... 7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ..... 7.80
Lackawanna,N.Y. B2 .... 7.80
Munhall,Pa. U5 ..... 7.75
S.Chicago,Ill. U5 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.325
Lackawanna,N.Y. B2 .... 5.325
Munhall,Pa. U5 ..... 5.275
S.Chicago,Ill. U5 ..... 5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 .... 6.225
Munhall,Pa. U5 ..... 6.225
S.Chicago,Ill. U5 ..... 6.225

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 ..... 5.10
Aliquippa,Pa. J5 ..... 4.85
Ashland,Ky. (15) A10 .. 5.10
Bessemer,Ala. T2 ..... 5.10
Clairton,Pa. U5 ..... 5.10
Claymont,Del. C22 ..... 5.70
Cleveland J5, R2 ..... 5.20
Coatesville,Pa. L7 ..... 5.50
Conshohocken,Pa. A3 .... 5.20
Detroit M1 ..... 4.95
Ecorse,Mich. G5 ..... 4.95
Fairfield,Ala. T2 ..... 5.10
Fontana,Calif.(30) K1 .. 5.60
Gary,Ind. U5 ..... 5.10
Geneva,Utah C11 ..... 5.10
GraniteCity,Ill. G4 ..... 5.05
Harrisburg,Pa. P4 ..... 5.80
Houston S5 ..... 4.95
Ind.Harbor,Ind. I-2, Y1 5.10
Johnstown,Pa. B2 ..... 5.10
Lackawanna,N.Y. B2 .... 5.10
LoneStar,Tex. L6 ..... 5.20
Minnequa,Colo. C10 .... 5.70
Munhall,Pa. U5 ..... 5.10
Newport,Ky. A2 ..... 5.10
Pittsburgh J5 ..... 4.85
Riverdale,Ill. A1 ..... 5.10
Seattle B3 ..... 5.75
Sharon,Pa. S3 ..... 4.85
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 .... 5.10
Sterling,Ill. N15 ..... 5.10
Steubenville,O. W10 ..... 5.10
Warren,O. R2 ..... 5.10
Youngstown R2, U5, Y1 5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 7.35
Fontana,Calif. K1 ..... 7.00
Geneva, Utah C11 ..... 6.75
Johnstown,Pa. B2 ..... 7.00
SparrowsPoint,Md. B2 .... 7.00

PLATES, Wrought Iron
Economy,Pa. B14 ..... 11.95

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.25
Bessemer,Ala. T2 ..... 7.625
Clairton,Pa. U5 ..... 7.625
Claymont,Del. C22 ..... 7.625
Cleveland J5, R2 ..... 7.625
Coatesville,Pa. L7 ..... 7.55
Conshohocken,Pa. A3 .... 7.625
Ecorse,Mich. G5 ..... 7.35
Fairfield,Ala. T2 ..... 7.625
Fontana,Calif.(30) K1 .. 8.00
Gary,Ind. U5 ..... 7.625
Geneva,Utah C11 ..... 7.625
Houston S5 ..... 7.35
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 ..... 7.625
Munhall,Pa. U5 ..... 7.625
Pittsburgh J5 ..... 7.25
Seattle B3 ..... 8.15
Sharon,Pa. S3 ..... 7.25
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2 .. 7.625
Warren,O. R2 ..... 7.625
Youngstown U5, Y1 ..... 7.625

PLATES, Alloy
Aliquippa,Pa. J5 ..... 6.85
Claymont,Del. C22 ..... 7.20
Coatesville,Pa. L7 ..... 7.20
Fontana,Calif.(30) K1 .. 7.60
Gary,Ind. U5 ..... 7.20
Houston S5 ..... 6.95
Ind.Harbor,Ind. Y1 ..... 7.20
Johnstown,Pa. B2 ..... 7.20
Munhall,Pa. U5 ..... 7.20
Newport,Ky. A2 ..... 7.20
Pittsburgh J5 ..... 6.85
Seattle B3 ..... 7.75
Sharon,Pa. S3 ..... 6.85
S.Chicago,Ill. U5, W14 7.20
SparrowsPoint,Md. B2 .... 7.20
Youngstown Y1 ..... 7.20

FLOOR PLATES
Cleveland J5 ..... 5.925
Conshohocken,Pa. A3 .... 6.175
Harrisburg,Pa. P4 ..... 6.275
Ind.Harbor,Ind. I-2 ..... 6.175
Munhall,Pa. U5 ..... 6.175
S.Chicago,Ill. U5 ..... 6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10.. 5.10
Ashland l.c.l. (15) A10.. 5.60
Cleveland c.l. R2 ..... 5.60
Warren,O. c.l. R2 ..... 5.60

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..... 5.425
Aliquippa,Pa.(9) J5.... 5.075
Alton,Ill. L1 ..... 5.275
Atlanta(9) A11 ..... 5.275
Bessemer,Ala.(9) T2 ..... 5.425
Birmingham(9) C15 ... 5.075
Bridgeport,Conn. N19 .. 5.30
Buffalo(9) R2 ..... 5.425
Clairton,Pa. (9) U5 ..... 5.425
Cleveland(9) R2 ..... 5.425
Ecorse,Mich.(9) G5 .... 5.175
Emeryville,Calif. J7 ... 5.825
Fairfield,Ala.(9) T2 ..... 5.425
Fairless,Pa.(9) U5 ..... 5.575
Fontana,Calif.(9) K1 .. 5.775
Gary,Ind.(9) U5 ..... 5.425
Houston(9) S5 ..... 5.325
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 ..... 5.425
Joliet,Ill. P22 ..... 5.425
KansasCity,Mo.(9) S5.. 5.325
Lackawanna(9) B2 ..... 5.425
LosAngeles(9) B3 ..... 5.775
Milton,Pa. M18 ..... 5.575
Minnequa,Colo. C10 ... 5.525
Niles,Calif. P1 ..... 5.775
N.T'wanda,N.Y.(9)B11 5.425
Pittsburg,Calif.(9) C11 .. 6.125
Pittsburgh(9) J5 ..... 5.075
Portland,Oreg. O4 ..... 5.825
Seattle B3, N14 ..... 5.825
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 .... 5.425
S.SanFran.,Calif.(9)B3 5.825
Sterling,Ill.(1) N15 ..... 5.425
Sterling,Ill. N15 ..... 5.525
Struthers,O. Y1 ..... 5.425
Tonawanda,N.Y. B12 ... 5.45
Torrance,Calif.(9) C11 6.125
Youngstown(9) R2, U5 5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 ..... 7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.125
Bethlehem,Pa. B2 ..... 6.475
Bridgeport,Conn. N19 .. 6.20
Buffalo R2 ..... 6.475
Canton,O. R2, T7 ..... 6.475
Clairton,Pa. U5 ..... 6.475
Detroit S41 ..... 6.125
Ecorse,Mich. G5 ..... 6.225
Fairless,Pa. U5 ..... 6.625
Fontana,Calif. K1 .... 7.175
Gary,Ind. U5 ..... 6.475
Houston S5 ..... 6.375
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 ..... 6.475
KansasCity,Mo. S5 .... 6.375
Lackawanna,N.Y. B2 .... 6.475
LosAngeles B3 ..... 7.175
Massillon,O. R2 ..... 6.475
Midland,Pa. C18 ..... 6.125
Pittsburgh J5 ..... 6.125
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 .... 6.475
Struthers,O. Y1 ..... 6.475
Warren,O. C17 ..... 6.475
Youngstown U5 ..... 6.475

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 7.425
Bessemer,Ala. T2 ..... 7.925
Bethlehem,Pa. B2 ..... 7.425
Bridgeport,Conn. N19 .. 7.50
Clairton,Pa. U5 ..... 7.925
Cleveland R2 ..... 7.925
Ecorse,Mich. G5 ..... 7.525
Fairfield,Ala. T2 ..... 7.925
Fontana,Calif. K1 .... 8.125
Gary,Ind. U5 ..... 7.925
Houston S5 ..... 7.675
Ind.Harbor,Ind. Y1 ..... 7.925
Johnstown,Pa. B2 ..... 7.425
KansasCity,Mo. S5 ..... 7.675
Lackawanna,N.Y. B2 .. 7.425
LosAngeles B3 ..... 8.125
Pittsburgh J5 ..... 7.425
Seattle B3 ..... 8.175
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 .... 7.925
S.SanFrancisco B3 .... 8.175
Struthers,O. Y1 ..... 7.925
Youngstown U5 ..... 7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 .... 5.575
Houston(9) S5 ..... 5.325
KansasCity,Mo.(9) S5.. 5.325
Lackawanna(9) B2 ..... 5.425
Sterling,Ill. N15 ..... 5.525
Sterling,Ill.(1) N15 ..... 5.425
Tonawanda,N.Y. B12 .. 5.45

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.075
Atlanta A11 ..... 5.575
Joliet,Ill. P22 ..... 5.075
Niles,Calif. P1 ..... 5.85
Pittsburgh J5 ..... 5.075
Portland,Oreg. O4 ..... 5.85
SanFrancisco S7 ..... 5.95

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.20
Clairton,Pa. U5 ..... 6.55
Gary,Ind. U5 ..... 6.55
Houston S5 ..... 6.45
KansasCity,Mo. S5 .... 6.45
Pittsburgh J5 ..... 6.20
Youngstown U5 ..... 6.55

BARS, C.F., Leaded Alloy (including leaded extra)
Ambridge,Pa. W18 .... 9.475
BeaverFalls,Pa. M12 .. 9.475
Chicago W18 ..... 9.475
Cleveland C20 ..... 9.475
LosAngeles S30 ..... 11.10
LosAngeles P2 ..... 11.35
Monaca,Pa. S17 ..... 9.475
Newark,N.J. W18 ..... 9.65
Warren,O. C17 ..... 9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 6.85
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 ..... 7.45
Bridgeport,Conn. N19 .. 7.20
Buffalo B5 ..... 6.90
Camden,N.J. P13 ..... 7.30
Carnegie,Pa. C12 ..... 6.85
Chicago W18 ..... 6.85
Cleveland A7, C20 .... 7.30
Detroit B5, P17 ..... 7.05
Detroit S41 ..... 6.85
Donora,Pa. A7 ..... 7.30
Elyria,O. W8 ..... 6.85
FranklinPark,Ill. N5 ... 6.85
Gary,Ind. R2 ..... 7.30
GreenBay,Wis. F7 ..... 6.85
Hammond,Ind. L2, M13. 6.85
Hartford,Conn. R2 ..... 7.80
Harvey,Ill. B5 ..... 6.85
LosAngeles(49) S30 .... 8.30
LosAngeles R2 ..... 9.20
LosAngeles P2 ..... 8.30
Mansfield,Mass. B5 .... 7.40
Massillon,O. R2, R8 ..... 7.30
Midland,Pa. C18 ..... 6.85
Monaca,Pa. S17 ..... 6.85
Newark,N.J. W18 ..... 7.30
NewCastle,Pa.(17) B4... 6.85
Pittsburgh J5 ..... 6.85
Plymouth,Mich. P5 .... 7.10
Putnam,Conn. W18 .... 7.40
Readville,Mass. C14 .... 7.40
S.Chicago,Ill. W14 .... 7.30
SpringCity,Pa. K3 ..... 7.30
Struthers, O. Y1 ..... 7.30
Waukegan,Ill. A7 ..... 7.30
Youngstown F3, Y1 ..... 7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19. 6.10

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .... 8.325
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 ..... 8.325
Bridgeport,Conn. N19 .. 8.475
Buffalo B5 ..... 8.325
Camden,N.J. P13 ..... 8.50
Canton,O. T7 ..... 8.325
Carnegie,Pa. C12 ..... 8.325
Chicago W18 ..... 8.325
Cleveland A7, C20 .... 8.325
Detroit B5, P17 ..... 8.525
Detroit S41 ..... 8.325
Donora,Pa. A7 ..... 8.325
Elyria,O. W8 ..... 8.325
FranklinPark,Ill. N5 .. 8.325
GreenBay,Wis. F7 .... 8.325
Hammond,Ind. L2,M13. 8.325
Hartford,Conn. R2 ..... 9.075
Harvey,Ill. B5 ..... 8.325
Lackawanna,N.Y. B2 .. 8.325
LosAngeles S30 ..... 10.10
LosAngeles P2 ..... 10.20
Mansfield,Mass. B5 ... 8.625
Massillon,O. R2, R8 ..... 8.775
Midland,Pa. C18 ..... 8.325
Monaca,Pa. S17 ..... 8.325
Newark,N.J. W18 ..... 8.50
Plymouth,Mich. P5 .... 8.525
S.Chicago W14 ..... 8.775
SpringCity,Pa. K3 ..... 8.50
Struthers,O. Y1 ..... 8.775
Warren,O. C17 ..... 8.775
Waukegan,Ill. A7 ..... 8.325
Worcester,Mass. A7 .... 8.625
Youngstown F3, Y1 ..... 8.775

BARS, Reinforcing (To Fabricators)
Ala.City,Ala. R2 ..... 5.425
Atlanta A11 ..... 5.275
Birmingham C15 ..... 5.075
Bridgeport,Conn. N9 ... 5.30
Buffalo R2 ..... 5.425
Cleveland R2 ..... 5.425
Ecorse,Mich. G5 ..... 5.425
Emeryville,Calif. J7 .. 5.825

Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....5.775
Ft.Worth,Tex.(4) T4 ..5.525
Gary,Ind. U5 .....5.425
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 .....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.525
Lackawanna,N.Y. B2 ...5.425
LosAngeles B3 .....5.775
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....5.775
Pittsburg,Calif. C11 ....6.125
Pittsburgh J5 .....5.075
Portland,Oreg. O4 ....5.825
SandSprings,Okla. S5 ..5.575
Seattle B3, N14 .....5.825
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 .....5.425
S.SanFrancisco B3 ....5.825
SparrowsPoint,Md. B2 ...5.425
Sterling,Ill.(1) N15 ....5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.65
Torrance,Calif. C11 ....6.125
Youngstown R2, U5 ....5.425

BARS, Reinforcing
(Fabricated; to Consumers)

Boston B2 .....7.30
Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown,Pa. ¼-1" B2 6.73
KansasCity,Mo. S5 .....7.00
Lackawanna,N.Y. B2 ..6.50
Marion,O. P11 .....6.70
New York U8 .....7.20
Pittsburgh J5, U8 .....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ⅛-1" B2 ..6.73
Williamsport,Pa. S19 ..6.85

RAIL STEEL BARS

Chicago Hts.(3) C2, I-2 5.325
Chicago Hts.(4)(44) I-2 5.325
Chicago Hts.(4) C2 ....5.075
Ft.Worth,Tex.(26) T4..5.525
Franklin,Pa.(3) F5 ....5.10
Franklin,Pa.(4) F5 ...5.075
JerseyShore,Pa.(4) J8 ..5.10
Marion,O.(3) P11 .....5.10
Moline,Ill.(3) R2 .....5.225
Tonawanda(3) B12 .....5.15
Tonawanda(4) B12 .....5.65
Williamsport,Pa.(3) S19.5.15

Bars, Wrought Iron

Economy,Pa.(S.R.)B14 13.15
Economy,Pa.(D.R.)B14 16.35
Economy(Staybolt)B14. 16.80
McK.Rks.(S.R.) L5 .. 13.15
McK.Rks.(D.R.) L5 ...18.00
McK.Rks.(Staybolt) L5 19.15

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.675
Ashland,Ky.(8) A10 ...4.675
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....4.775
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.525
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill.(8) G4. 4.875
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2. 4.675
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ....4.925
Niles,O. M21 .....4.675
Pittsburg,Calif. C11 ....5.625
Pittsburgh J5 .....4.675
Portsmouth,O. P12 ....4.675
River Dale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.675
S.Chicago,Ill. W14 .....4.925
SparrowsPoint,Md. B2..4.675
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.675
Youngstown U5, Y1 ....4.925

SHEETS, H.R., (19 Ga. & Lighter)

Niles,O. M21 .....5.75

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 .....8.10
Irvin,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 .....8.10

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength, Low-Alloy

Cleveland J5, R2 .....7.275
Conshohocken,Pa. A3 ..7.425
Ecorse,Mich. G5 .....7.00
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Fontana,Calif. K1 ....7.75
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna(35) B2 ....7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....6.90
S.Chicago,Ill. U5, W14 7.275
SparrowsPoint(36) B2 ..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 .....6.90
Youngstown U5, Y1 ....7.275

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....5.425
Warren,O. R2 .....5.425

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....5.75
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ....6.10
Detroit M1 .....5.75
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ..5.75
Fontana,Calif. K1 .....7.00
Gary,Ind. U5 .....5.75
GraniteCity,Ill. G4 .....5.95
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....5.75
Middletown,O. A10 .....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 .....7.00
Pittsburgh J5 .....5.75
Portsmouth,O. P12 .....5.75
SparrowsPoint,Md. B2 ..5.75
Steubenville,O. W10 ....5.75
Warren,O. R2 .....6.05
Weirton,W.Va. W6 .....5.75
Yorkville,O. W10 .....5.75
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled
High-Strength, Low-Alloy

Cleveland J5, R2 .....8.975
Ecorse,Mich. G5 .....8.625
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ....9.775
Gary,Ind. U5 .....8.975
Indiana Harbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ...8.975
Pittsburgh J5 .....8.525
SparrowsPoint(38) B2 ..8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.525
Youngstown Y1 .....8.975

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown,O. A10 ....6.25
Warren,O. R2 .....6.50

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	6.95	7.20
Canton,O. R2	6.95	7.20
Fairfield T2	6.65	6.90
Gary,Ind. U5	6.65	6.90
GraniteCity,Ill. G4	6.85	...
Ind.Harbor I-2	6.95	7.20
Irvin,Pa. U5	6.65	6.90
Kokomo,Ind. C16	6.75	...
MartinsFry. W10	6.65	6.90
Pittsburgh J5	6.65	...
Pitts.,Calif. C11	7.40	...
SparrowsPt. B2	6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .....7.20

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 .....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60†
GraniteCity,Ill. G4 ....6.50*
Ind.Harbor,Ind. I-2 ....6.60†
Irvin,Pa. U5 .....6.60†
Kokomo,Ind. C16 .....6.40‡
MartinsFerry,O. W10 ...6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.30†
SparrowsPt.,Md. B2 ...6.30†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.30*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .....7.025

SHEETS, Galvanized
High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPoint(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.70
Irvin,Pa. U5 .....6.70

SHEETS, Galvanized Ingot Iron
(Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.55
Middletown,O. A10 .....6.55

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.125
Niles,O.(28) R2 .....7.125
Weirton,W.Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.95
Butler,Pa. A10 (type 2).9.05

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.525
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 .....6.625
Niles,O. M21 .....6.325
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.35
Ind.Harbor,Ind. I-2 ...8.175
Yorkville,O. W10 .....8.175

SHEETS, Long Terne Steel
(Commercial Quality)

Beech Bottom,W.Va. W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....6.70
Middletown,O. A10 .....7.00
Niles,O. M21 .....6.70
Weirton,W.Va. W6 .....6.70

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.10

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.
E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H7 Helical Tube Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.
N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Dawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
T2 Tenn. Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel&Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	*4.925*
Allenport,Pa. P7	4.675
Alton,Ill. L1	4.875
Ashland,Ky. (8) A10	*4.925*
Atlanta A11	4.875
Bessemer,Ala. T2	*4.925*
Birmingham C15	4.675
Buffalo (27) R2	*4.925*
Conshohocken,Pa. A3	*4.975*
Detroit M1	4.775
Ecorse,Mich. G5	4.775
Fairfied,Ala. T2	*4.925*
Fontana,Calif. K1	5.525
Gary,Ind. U5	*4.925*
Houston S5	4.925
Ind.Harbor,Ind. I-2, Y1	*4.925*
Johnstown,Pa.(25) B2	*4.925*
KansasCity,Mo. S5	4.925
Lackaw'na,N.Y.(25) B2	*4.925*
LosAngeles(25) B3	5.425
Minnequa,Colo. C10	5.775
Pittsburg,Calif. C11	*5.675*
Riverdale,Ill. A1	*4.925*
SanFrancisco S7	5.95
Seattle(25) B3	5.675
Seattle N14	5.675
Sharon,Pa. S3	4.675
S.Chicago,Ill. W14	*4.925*
S SanFrancisco(25) B3	5.425
SparrowsPoint,Md. B2	*4.925*
Sterling,Ill.(1) N15	4.675
Sterling,Ill. N15	4.775
Torrance,Calif. C11	*5.675*
Warren,O. R2	*4.925*
Weirton W.Va. W6	4.675
Youngstown U5	*4.925*

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	7.75
Gary,Ind. U5	*8.10*
Ind.Harbor,Ind. Y1	*8.10*
LosAngeles B3	8.95
Newport,Ky. A2	*8.10*
Sharon,Pa. S3	7.75
S.Chicago,Ill. W14	*8.10*
Youngstown U5, Y1	*8.10*

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	*7.325*
Conshohocken,Pa. A3	*7.325*
Ecorse,Mich. G5	7.05
Fairfield,Ala. T2	*7.325*
Gary,Ind. U5	*7.325*
Houston S5	7.20
Ind.Harbor,Ind. I-2, Y1	*7.325*
KansasCity,Mo. S5	7.20
Lackawanna,N.Y. B2	*9.325*
LosAngeles(25) B3	7.70
Seattle(25) B3	7.95
Sharon,Pa. S3	6.95
S.Chicago,Ill. W14	*7.325*
S SanFrancisco(25) B3	7.70
SparrowsPoint,Md. B2	*9.325*
Warren,O. R2	*7.325*
Weirton,W.Va. W6	6.95
Youngstown U5, Y1	*7.325*

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.925
Warren,O. R2	5.425

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.85
Baltimore T6	6.85
Boston T6	7.40
Buffalo S40	6.85
Cleveland J5	6.85
Cleveland A7	*7.15*
Conshohocken,Pa. A3	*7.20*
Dearborn,Mich. D3	6.95
Detroit D2, M1, P20	6.95
Dover,O. G6	6.85
Ecorse,Mich. G5	6.95
Evanston,Ill. M22	6.95
Follansbee,W.Va. F4	6.85
Fontana,Calif. K1	8.70
FranklinPark,Ill. T6	6.95
Ind.Harbor,Ind. Y1	*7.15*
Indianapolis C8	7.00
LosAngeles C1	8.90
NewBedford,Mass. R10	7.30
NewBritain(10) S15	6.85
NewCastle,Pa. B4, E5	6.85
NewHaven,Conn. D2	7.30
NewKensington,Pa. A6	6.85
Pawtucket,R.I. R3	7.50
Pawtucket,R.I. N8	7.40
Pittsburgh J5	6.85
Riverdale,Ill. A1	*7.25*
Rome,N.Y.(32) R6	6.85
Sharon,Pa. S3	6.85
Trenton,N.J.(31) R5	8.30
Wallingford,Conn. W2	7.30
Warren,O. R2, T5	6.85
Weirton,W.Va. W6	6.85
Worcester,Mass. A7	*7.70*
Youngstown C8, Y1	*7.15*

STRIP, Cold-Rolled Alloy

Boston T6	14.90
Carnegie,Pa. S18	14.55
Cleveland A7	14.55
Dover,O. G6	14.55
FranklinPark,Ill. T6	14.55
Harrison,N.J. C18	14.55
Indianapolis C8	14.70
Pawtucket,R.I. N8	14.90
Sharon,Pa. S3	14.55
Worcester,Mass. A7	14.85
Youngstown C8	14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.00
Dearborn,Mich. D3	10.10
Dover,O. G6	10.10
Ecorse,Mich. G5	10.10
Ind.Harbor,Ind. Y1	10.20
Sharon,Pa. S3	10.00
Warren,O. R2	10.00
Weirton,W.Va. W6	10.00
Youngstown Y1	10.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.20	10.40	12.60	15.60	18.55
Boston T6	9.20	10.40	12.60	15.60	18.55
Bristol,Conn. W1	...	10.40	12.60	15.60	18.55
Carnegie,Pa. S18	8.65	10.10	12.30	15.30	...
Cleveland A7	8.65	10.10	12.30	15.30	18.25
Cleveland C7	...	10.10	12.30	15.30	18.25
Dearborn,Mich. D3	8.75	10.20	12.40	...	...
Detroit D2	8.75	10.20	12.40	15.40	...
Dover,O. G6	8.65	10.10	12.30	15.30	18.25
Evanston,Ill. M22	8.65	10.10	12.30	...	...
FranklinPark,Ill. T6	8.75	10.10	12.30	15.30	18.25
Harrison,N.J. C18	...	...	12.60	15.60	18.55
Indianapolis C8	8.80	10.25	12.30	15.30	18.25
LosAngeles C1	10.85	12.30	14.50	...	...
NewBritain,Conn.(10) S15	8.65	10.10	12.30	15.30	18.25
NewCastle,Pa. B4, E5	8.65	10.10	12.30	15.30	...
NewHaven,Conn. D2	9.10	10.40	12.60	15.60	...
NewKensington,Pa. A6	8.65	10.10	12.30	15.30	...
NewYork W3	...	10.40	12.60	15.60	18.55
Pawtucket,R.I. N8	9.20	10.40	12.60	15.60	18.55
Riverdale,Ill. A1	8.75	10.10	12.30	15.30	18.25
Rome,N.Y.(32) R6	8.65	10.10	12.30	15.30	18.25
Sharon,Pa. S3	8.65	10.10	12.30	15.30	18.25
Trenton,N.J. R5	...	10.40	12.60	15.60	18.55
Wallingford,Conn. W2	9.10	10.40	12.60	15.60	18.45
Warren,O. T5	8.65	10.10	12.30	15.30	18.25
Worcester,Mass. A7, T6	9.20	10.40	12.60	15.60	18.55
Youngstown C8	8.65	10.10	12.30	15.30	18.25

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	17.10	20.95	25.30
Buffalo W10	17.10	...	...
FranklinPark,Ill. T6	17.45	21.30	25.65
Harrison N.J. C18	17.10	20.95	25.30
New York W3	17.10	20.95	25.30
Palmer,Mass. W12	17.10	...	...
Trenton,N.J. R5	17.10	20.95	25.30
Worcester,Mass. A7, T6	17.10	20.95	25.30
Youngstown C8	17.45	21.30	25.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.60

STRIP, C.R. Electrogalvanized

Cleveland A7	6.85*
Dover,O. G6	6.85*
Evanston,Ill. M22	6.95
Riverdale,Ill. A1	*7.25**
Warren,O. B9, T5	6.85*
Worcester,Mass. A7	7.40*
Youngstown C8	6.85*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.975

TIGHT COOPERAGE HOOP

Atlanta A11	5.40
Riverdale,Ill. A1	5.25
Sharon,Pa. S3	5.10
Youngstown U5	5.10

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	....	11.00	12.05	13.05
Brackenridge,Pa. A4	...	....	11.00	12.05	13.05
Mansfield,O. E6	9.20	10.35	11.00	12.05	13.05
Newport,Ky. A2	*9.625*	*11.10*	*11.20*	*12.90*	*13.95*
Niles,O. M21	9.20	10.35	11.00	12.05	....
Vandergrift,Pa. U5	...	10.35	11.00	12.05	13.05
Warren,O. R2	9.20	10.35	11.00	12.05	....
Zanesville,O. A10	...	10.35	11.00	12.05	13.05
Zanesville,O. A10 (FP coils)	...	10.85	11.525	12.575	13.55
Zanesville,O. A10 (SP coils)	...	....	11.025	12.075	13.05

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	....	11.525	12.575	13.55
GraniteCity,Ill. G4	9.40*	10.55*	11.225*	12.275*	....
IndianaHarbor,Ind. I-2	*9.625*	*10.85**	*11.55**	*12.65**	....
Mansfield,O. E6	9.70	10.85	11.525	12.575	13.55
Vandergrift,Pa. U5	9.20*	10.35*	11.025*	12.075*	13.05*
Vandergrift,Pa. U5	...	10.85†	11.525†	12.575†	13.55†
Warren,O. R2	9.20*	10.85	11.525	12.575	13.55

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge,Pa. A4	14.05	....	....	....
Vandergrift,Pa. U5	14.05	14.60	15.10	16.15
Zanesville,O. A10	14.05	14.60	15.10	16.15

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	16.90	18.50	19.00	19.50	....
Butler,Pa. A10	....	....	....	18.50	19.00	19.50
Vandergrift,Pa. U5	15.90	16.90	18.50	19.00	19.50	14.55**
Warren,O. R2	....	....	....	....	....	14.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	7.425	7.625	....
Niles,O. R2	7.425	7.625	7.925

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala.T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	*7.65*
Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.40
Atlanta A11	7.40
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Chicago W13	7.20
Cleveland C20	7.20
Cleveland A7	*7.65*
Crawfordsville,Ind. M8	7.30
Donora,Pa. A7	*7.65*
Duluth A7	*7.65*
Fairfield,Ala. T2	*7.65*
Fostoria,O.(24) S1	7.30
Houston S5	7.45
Jacksonville,Fla. M8	7.55
Johnstown Pa. B2	7.20
Joliet,Ill. A7	*7.65*
KansasCity,Mo. S5	7.45
Kokomo,Ind. C16	7.30
LosAngeles B3	8.15
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
N Tonawanda,N.Y. B11	7.20
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	*8.60*
Portsmouth,O. P12	7.20
Rankin,Pa. A7	*7.65*
S.Chicago,Ill. R2	*7.65*
S SanFrancisco C10	8.15
SparrowsPoint,Md. B2	7.30
Sterling,Ill.(1) N15	*7.65*
Sterling,Ill. N15	*7.75*
Struthers,O. Y1	*7.65*
Waukegan,Ill. A7	*7.65*
Worcester,Mass. A7	*7.95*

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	11.90
Buffalo W12	11.90
Cleveland A7	11.90
Donora,Pa. A7	11.90
Duluth A7	11.90
Johnstown,Pa. B2	11.90
Minnequa,Colo. C10	12.025
Monessen,Pa. P16	11.90
Muncie,Ind. I-7	12.10
NewHaven,Conn. A7	12.20
Palmer,Mass. W12	12.20
Pittsburg,Calif. C11	12.70
Portsmouth,O. P12	11.90
Roebling,N.J. R5	12.20
SparrowsPt.,Md. B2	12.00
Struthers,O. Y1	11.90
Trenton,N.J. A7	12.20
Waukegan,Ill. A7	11.90
Worcester,Mass. A7	12.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	8.70
Alton,Ill. L1	8.90
Buffalo W12	8.70
Cleveland A7	*9.30*
Donora,Pa. A7	*9.30*
Duluth A7	*9.30*
Johnstown,Pa. B2	8.70
KansasCity,Mo. S5	8.95
Minnequa,Colo. C10	8.90
LosAngeles B3	9.65
Monessen,Pa. P7, P16	8.70
NewHaven,Conn. A7	*9.60*
Palmer,Mass. W12	9.00
Pittsburg,Calif. C11	*10.25*
Portsmouth,O. P12	9.00
Roebling,N.J. R5	9.00
S.Chicago,Ill. R2	8.70
S.SanFrancisco C10	9.65
SparrowsPt.,Md. B2	8.80
Struthers,O. Y1	8.70
Trenton,N.J. A7	*9.60*
Waukegan,Ill. A7	*9.30*
Worcester,Mass. A7	*9.60*

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	9.025
Alton,Ill. L1	9.225
Bartonville Ill. K4	9.125
Buffalo W12	9.025
Cleveland A7	*9.30*
Donora,Pa. A7	*9.30*
Duluth A7	*9.30*
Fostoria,O. S1	9.075
Johnstown,Pa. B2	9.025
LosAngeles B3	9.975
Milbury,Mass.(12) N6	9.325
Minnequa,Colo. C10	9.275
Monessen,Pa. P7, P16	9.025
Muncie,Ind. I-7	9.225
Palmer,Mass. W12	9.325
Pittsburg,Calif. C11	*10.25*
Portsmouth,O. P12	9.025
Roebling,N.J. R5	9.325
S.Chicago,Ill. R2	*9.30*
S.SanFrancisco C10	9.975
SparrowsPt.,Md. B2	9.125
Struthers,O. Y1	*9.30*
Trenton,N.J. A7	*9.60*
Waukegan,Ill. A7	*9.30*
Worcester,Mass. T6 W12	9.325
Worcester,Mass. A7	*9.60*

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	14.65
Bartonville,Ill. K4	14.55
Buffalo W12	14.45
Chicago W13	14.45
Cleveland A7	14.45
Crawfordsville,Ind. M8	14.25
Fostoria,O. S1	14.45
Jacksonville,Fla. M8	14.50
Johnstown,Pa. B2	14.45
Kokomo,Ind. C16	14.45
Monessen,Pa. P7	14.45
Muncie,Ind. I-7	14.65
Palmer,Mass. W12	14.75
Roebling,N.J. C10	14.45
S.SanFrancisco C10	14.80
Waukegan,Ill. A7	14.45
Worcester,Mass. A7, T6	14.75

ROPE WIRE

Bartonville,Ill. K4	12.00
Buffalo W12	12.00
Fostoria,O. S1	12.00
Johnstown,Pa. B2	12.00
Monessen,Pa. P7	12.00
Muncie,Ind. I-7	12.20
Palmer,Mass. W12	12.30
Portsmouth,O. P12	12.00
Roebling,N.J. R5	12.30
SparrowsPt.,Md. B2	12.10
Struthers,O. Y1	12.00
Worcester,Mass. J4	12.30

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4	15.75
Monessen,Pa. P16	15.45
Roebling,N.J. R5	16.10

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.75
Baltimore T6	11.05
Boston T6	11.05
Buffalo W12	10.75
Chicago W13	10.85
Cleveland A7	10.75
Crawfordsville,Ind. M8	10.75
Dover,O. G6	10.75
Fostoria,O. S1	11.05
FranklinPark,Ill. T6	10.85
Kokomo,Ind. C16	10.75
Massillon,O. R8	10.75
Milwaukee C23	10.95
Monessen,Pa. P7, P16	10.75
NewKensington, Pa. A6	10.75
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.05
Riverdale,Ill. A1	10.85
Rome,N.Y. R6	10.75
Trenton,N.J. R5	11.05
Worcester,Mass. A7, T6	11.05

NAILS, Stock — Col.

AlabamaCity,Ala. R2	*173*
Aliquippa,Pa. J5	164
Atlanta A11	166
Bartonville,Ill. K4	166
Chicago W13	164
Cleveland A9	170
Crawfordsville,Ind. M8	166
Donora,Pa. A7	*173*
Duluth A7	*173*
Houston,Tex. S5	169
Fairfield,Ala. T2	*173*
Jacksonville,Fla.(20) M8	175
Joliet, Ill. A7	*173*
Johnstown,Pa. B2	164
KansasCity,Mo. S5	169
Kokomo,Ind. C16	166
Minnequa,Colo. C10	169
Monessen,Pa. P7	164
Pittsburg,Calif. C11	*192*
Rankin,Pa. A7	*173*
S.Chicago,Ill. R2	*173*
SparrowsPt.,Md. B2	166
Sterling,Ill.(7) N15	166
Worcester,Mass. A7	*179*

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.75

NAILS, Cut (100 lb keg)

To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES — Col.

Donora,Pa. A7	*175*
Duluth A7	*175*
Fairfield,Ala. T2	*175*
Joliet,Ill. A7	*175*
Pittsburg,Calif.(45) C11	*192*
Rankin,Pa. A7	*175*
Worcester,Mass. A7	*181*

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.82
Atlanta A11	9.63
Bartonville,Ill. K4	9.63
Buffalo W12	9.82
Chicago W13	9.82
Crawfordsville,Ind. M8	9.63
Donora,Pa. A7	9.82
Duluth A7	9.82
Fairfield, Ala. T2	9.82
Houston S5	10.07
Jacksonville,Fla. M8	10.09
Johnstown,Pa. B2	9.82
Joliet,Ill. A7	9.82
KansasCity,Mo. S5	10.07
Kokomo,Ind. C16	9.92
LosAngeles B3	10.61
Minnequa,Colo. C10	10.07
Pittsburg,Calif. C11	10.60
S.Chicago,Ill. R2	9.82
S.SanFrancisco C10	10.60
SparrowsPt.,Md. B2	9.92
Sterling,Ill.(37) N15	9.82

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.15
Atlanta A11	9.95
Bartonville,Ill. K4	9.95
Buffalo W12	10.15
Chicago W13	10.15
Crawfordsville,Ind. M8	9.95
Donora,Pa. A7	10.15
Duluth A7	10.15
Fairfield,Ala. T2	10.15
Houston S5	10.40
Jacksonville,Fla. M8	10.41
Johnstown,Pa. B2	10.15
Joliet,Ill. A7	10.15
KansasCity,Mo. S5	10.40
Kokomo,Ind. C16	10.25
Los Angeles B3	10.95
Minnequa,Colo. C10	10.40
Pittsburg,Calif. C11	*11.40*
S.Chicago,Ill. R2	10.15
S.SanFrancisco C10	10.95
SparrowsPt.,Md. B2	10.25
Sterling,Ill.(37) N15	10.15

Coil Interim

AlabamaCity,Ala. R2	$10.20
Atlanta A11	10.00
Bartonville,Ill. K4	10.00
Buffalo W12	10.20
Chicago W13	10.20
Crawfordsville,Ind. M8	10.00
Donora,Pa. A7	10.20
Duluth A7	10.20
Fairfield,Ala. T2	10.20
Houston S5	10.45
Jacksonville,Fla. M8	10.46
Johnstown,Pa. B2	10.20
Joliet,Ill. A7	10.20
KansasCity,Mo. S5	10.45
Kokomo,Ind. C16	10.30
LosAngeles B3	11.00
Minnequa,Colo. C10	10.45
Pittsburg,Calif. C11	11.00
S.Chicago,Ill. R2	10.20
S.SanFrancisco C10	11.00
SparrowsPt., Md. B2	10.30
Sterling,Ill.(37) N15	10.20

BALE TIES, Single Loop — Col.

AlabamaCity,Ala. R2	*212*
Atlanta A11	192
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	*212*
Duluth A7	*212*
Fairfield,Ala. T2	*212*
Houston S5	201
Jacksonville,Fla. M8	197
Joliet,Ill. A7	*212*
KansasCity,Mo. S5	201
Kokomo,Ind. C16	198
Minnequa,Colo. C10	201
Pittsburg,Calif. C11	220
S.SanFrancisco C10	220
Sterling,Ill.(7) N15	196
SparrowsPt.,Md. B2	198
Tonawanda,N.Y. B12	169
Williamsport,Pa. S19	175

FENCE POSTS

ChicagoHts.,Ill. C2, I-2	167
Duluth A7	167
Franklin,Pa. F5	167
Huntington,W.Va. W7	169
Johnstown,Pa. B2	167
Marion,O. P11	167
Minnequa,Colo. C10	172
Sterling,Ill.(1) N15	167
Tonawanda,N.Y. B12	169
Williamsport,Pa. S19	175

WIRE, Barbed — Col.

AlabamaCity,Ala. R2	*193***
Aliquippa,Pa. J5	181§
Atlanta A11	190*
Bartonville,Ill. K4	190
Crawfordsville,Ind. M8	190
Donora,Pa. A7	*193†*
Duluth A7	*193†*
Fairfield,Ala. T2	*193†*
Houston,Tex. S5	189**
Jacksonville,Fla. M8	195
Johnstown,Pa. B2	188*
Joliet,Ill. A7	*193†*
KansasCity,Mo. S5	189**
Kokomo,Ind. C16	186†
Minnequa,Colo. C10	189**
Monessen,Pa. P7	188*
Pittsburg,Calif. C11	[illegible]
Rankin,Pa. A7	*193†*
S.Chicago,Ill. R2	184**
S.SanFrancisco C10	[illegible]**
SparrowsPoint,Md. B2	[illegible]
Sterling,Ill.(7) N15	191††

WOVEN FENCE, 9-15 Ga. — Col.

Ala.City,Ala. R2	*187***
Aliq'ppa,Pa. 9-14½ga.J2	179§
Atlanta A11	182*
Bartonville,Ill. K4	182
Crawfordsville,Ind. M8	182
Donora,Pa. A7	*187†*
Duluth A7	*187†*
Fairfield,Ala. T2	*187†*
Houston,Tex. S5	181**
Jacksonville,Fla. M8	187
Johnstown,Pa.(43) B2	180*
Joliet,Ill. A7	*187†*
KansasCity,Mo. S5	181**
Kokomo,Ind. C16	178†
Minnequa,Colo. C10	181**
Monessen,Pa. 9 ga. P7	180*
Pittsburg,Calif. C11	*210†*
Rankin,Pa. A7	*187†*
S.Chicago,Ill. R2	*187***
Sterling,Ill.(7) N15	181††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	16.00	17.55**
Aliq'ppa,Pa.	J5 15.70	17.50
Bartonville K4	15.80	17.75
Cleveland A7	16.00	....
Crawf'dsville M8	15.80	17.75
Fostoria,O. S1	16.50	18.05†
Houston S5	16.25	17.80**
Jacksonville M8	16.05	18.00
Johnstown B2	16.00	17.95*
Kan.City,Mo. S5	16.25	....
Kokomo C16	16.10	17.65†
Minnequa C10	16.25	17.80*
P'lm'r,Mass.W12	16.30	17.85†
Pitts.,Calif. C11	16.35	17.90†
SparrowsPt. B2	16.10	18.05*
Sterling(37)N15	16.00	17.90††
Waukegan A7	16.00	17.55†
Worcester A7	16.30	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	*8.65*	*9.20***
Aliquippa J5	7.95	8.475§
Atlanta(48) A11	8.05	8.65*
Bartonville(48) K4	8.05	8.65
Buffalo W12	8.20	8.75†
Cleveland A7	*8.65*	....
Crawfordsville M8	8.05	8.65
Donora,Pa. A7	*8.65*	*9.20†*
Duluth A7	*8.65*	*9.20†*
Fairfield T2	*8.65*	*9.20†*
Houston(48) S5	8.45	9.00**
Jacks'ville,Fla. M8	8.30	8.90
Johnstown B2(48)	8.20	8.95*
Joliet,Ill. A7	*8.65*	*9.20†*
Kans.City(48) S5	8.45	9.00**
Kokomo C16	8.30	8.85†
LosAngeles B3	9.15	9.90*
Minnequa C10	8.45	9.00‡
Monessen P7(48)	7.95	8.55*
Palmer,Mass. W12	8.50	9.05†
Pitts.,Calif. C11	*9.60*	*10.15†*
Rankin,Pa. A7	*8.65*	*9.20†*
S.Chicago R2	*8.65*	*9.20***
S.SanFran. C10	9.15	9.70*
Spar'wsPt. B2(48)	8.30	9.05*
Sterling(37)(48)N15	8.35	9.10
Struth'rs,O.(48)Y1	*8.65*	*9.20‡*
Worcester,Mass.A7	*8.95*	*9.50†*

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	52.5
Longer than 6 in.	43.5
⅝ in. thru 1 in.:	
6 in. and shorter	43.5
Longer than 6 in.	41.5
1⅛ in. and larger:	
All lengths	41.5

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	52.5

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	32.0
Longer than 6 in.	19.0
⅝ in. thru 1 in.:	
6 in. and shorter	16.0
Longer than 6 in.	16.0
1⅛ in. and larger:	
All lengths	16.0

Lag Bolts

All diameters:	
6 in. and shorter	52.5
Longer than 6 in.	44.5

Plow and Tap Bolts

[illegible] and smaller by 6 [illegible] and shorter	52.0
[illegible] than ½ in. or [illegible]er than 6 in.	44.5

Plough Bolts 44.5

Step, Elevator, Tire Bolts 52.0

Stove Bolts, Slotted

1/8 to ¼-in. incl.:	
3 in. and shorter	54.00
5/16 to ½-in., inclusive	54.00

NUTS

Reg. & Heavy Square Nuts:

All sizes	58.0

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	44.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller	61.5
⅞ in. to 1 in., incl.	57.5
1⅛ in. to 1½ in., incl.	62.5
1⅝ in. and larger	56.0

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller	48.0
⅞ in. to 1 in., incl.	44.0
1⅛ in. to 1½ in., incl.	49.0

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	64.00
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger	56.0

Semifinished Hex Nuts, Reg. (Including Slotted):

⅝ in. and smaller	61.5
¾ in. to 1-in., incl.	64.0
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger	56.0

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller	44.0
¾, ⅞ and 1 in. diam.	27.0
Longer than 6 in.:	
⅝ in. and smaller	14.0
¾, ⅞ and 1 in. diam.	0.5

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller	31.0
¾, ⅞ and 1 in. diam.	9.0
Longer than 6 in.:	
⅝ in. and smaller	+6
¾, ⅞ and 1 in. diam.	+24

Flat Head Capscrews:

¾ in. and smaller	+65.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter	11
Longer than 6 in.	+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 11.50

7/16-in. under List less 23%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	24.55	23.54
1¼	13	....	29.01	23.36
1½	13	27.45	32.14	25.83
1¾	13	32.43	37.97	30.51
2	13	36.34	42.56	34.20
2¼	13	40.93	47.94	38.52
2¼	12	44.42	52.03	41.81
2½	12	48.94	57.31	46.05
2¾	12	52.99	62.05	49.88
3	12	56.51	66.18	53.19

RAILWAY MATERIALS

RAILS	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	*5.525*	*5.425*	*5.475*	*6.50*
Ensley,Ala. T2	*5.525*	*5.425*	....	*6.50*
Fairfield,Ala. T2	....	....	....	*6.50*
Huntington,W.Va. C15	....	....	....	6.25
Gary,Ind. U5	*5.525*	*5.425*	*5.475*	....
IndianaHarbor,Ind. I-2	*5.525*	*5.425*	*5.475*	....
Johnstown,Pa. B2	....	....	....	*(16)6.50*
Lackawanna,N.Y. B2	*5.525*	*5.425*	....	*6.50*
Minnequa,Colo. C10	5.275	5.175	....	6.75
Steelton,Pa. B2	*5.525*	*5.425*	....	....
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	*6.60*
Gary,Ind. U5	*6.60*
Ind.Harbor,Ind. I-2	*6.60*
Lackawanna,N.Y. B2	*6.60*
Minnequa,Colo. C10	6.275
Seattle B3	6.425
Steelton,Pa. B2	*6.60*
Torrance,Calif. C11	*6.75*

JOINT BARS

Bessemer,Pa. U5	*6.975*
Fairfield,Ala. T2	*6.975*
Ind.Harbor,Ind. I-2	*6.975*
Joliet,Ill. U5	*6.975*
Lackawanna,N.Y. B2	*6.975*
Minnequa,Colo. C10	6.60
Steelton,Pa. B2	*6.975*

AXLES

Ind.Harbor,Ind. S13	8.35
Johnstown,Pa. B2	*8.775*

TRACK BOLTS, Untreated

Cleveland R2	13.85
KansasCity,Mo. S5	13.85
Lebanon,Pa. B2	13.85
Minnequa,Colo. C10	13.85
Pittsburgh P14	13.10
Seattle B3	14.35

SCREW SPIKES

Lebanon,Pa. B2	13.60
Pittsburgh P14	12.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	*9.75*
Ind.Harbor,Ind. I-2, Y1	*9.75*
KansasCity,Mo. S5	9.225
Lebanon,Pa. B2	*9.75*
Minnequa,Colo. C10	9.225
Pittsburgh J5	9.225
Seattle B3	9.725
S.Chicago,Ill. R2	*9.75*
Struthers,O. Y1	*9.75*
Youngstown R2	*9.75*

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in; 6.23c; 1 15/16 to 8 in.; inclusive, 6.60c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜"and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.685c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 7.30c, for widths ⅝-in and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) Galvanized
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+5.25	+20.25	1.25	+15.5	3.75	+13	5.25	+11.5	5.25	+11.5	5	+11.75	7.5	+9.25
Ambridge, Pa. N2	+5.25	....	1.25	....	3.75	....	5.25	....	5.25	....	5	....	7.5	....
Lorain, O. N3	*+9.25*	*+24.25*	*+2.75*	*+19.5*	*+0.25*	*+17*	*1.25*	*+15.5*	*1.25*	*+15.5*	*1*	*+15.75*	*3.5*	*+13.25*
Youngstown Y1	*+9.25*	*+24.25*	*+2.75*	*+19.5*	*+0.25*	*+17*	*1.25*	*+15.5*	*1.25*	*+15.5*	*1*	*+15.75*	*3.5*	*+13.25*

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	*+9.25*	*+24.25*	*+2.75*	*+19.5*	*+0.25*	*+17*	*1.25*	*+15.5*	*1.25*	*+15.5*	*1*	*+15.75*	*3.5*	*+13.25*

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Alton, Ill. L1	....	....	....	....	....	....	7.25	+8	10.25	+4	13.75	0.5	16.25	1.25
Benwood, W. Va. W10	6.5	+20	+4.75	+28.25	+14.75	+36.25	*5.25*	*+10*	*8.25*	*+6*	*11.75*	*+15*	*14.25*	*+0.75*
Butler, Pa. F6	7.5	+19	+3	+26.5	+12.5	+34	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Fairless, Pa. N3	....	....	....	....	....	....	*3.25*	*+12*	*6.25*	*+8*	*9.75*	*+3.5*	*12.25*	*+2.75*
Fontana, Calif. K1	....	....	....	....	....	....	3.75	+19	+0.75	+15	2.75	+10.5	5.25	+9.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	*4.25*	*+11*	*7.25*	*+7*	*10.75*	*+2.5*	*13.25*	*+3.25*
Lorain, O. N3	....	....	....	....	....	....	*5.25*	*+10*	*8.25*	*+6*	*11.75*	*+1.5*	*14.25*	*+0.75*
Sharon, Pa. S4	6.5	+20	+4	+27.5	+13.5	+35	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Sparrows Pt., Md. B2	5.5	+21	+0.5	+28.5	+14.5	+36	7.25	+8	10.25	+4	13.75	0.5	16.25	1.25
Wheatland, Pa. W9	7.75	+19	+3	+26.5	+12.5	+34	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Youngstown R2, Y1	....	....	....	....	....	....	*4.25*	*+10*	*8.25*	*+6*	*11.75*	*+1.5*	*14.25*	*+0.75*

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	....	....	....	....
Alton, Ill. L1	16.75	2.25	17.25	2.75	18.75	2.5	18.75	2.5	....	....	....	....
Benwood, W. Va. W10	*14.75*	*0.25*	*15.25*	*0.75*	*16.75*	*0.5*	*16.75*	*0.5*	*6.25*	*+10.5*	*6.25*	*+10.5*
Etna, Pa. N2	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5
Fairless, Pa. N3	*12.75*	*+1.75*	*13.25*	*+1.25*	*14.75*	*+1.5*	*14.75*	*+1.5*	*4.25*	*+12.5*	*4.25*	*+12.5*
Fontana, Calif. K1	5.75	+8.75	6.25	+8.25	7.75	+8.5	7.75	+8.5	+2.75	+19.5	+2.75	+19.5
Indiana Harbor, Ind. Y1	*13.75*	*+0.75*	*14.25*	*+0.25*	*15.75*	*+0.5*	*15.25*	*+0.5*	*5.25*	*+11.5*	*5.25*	*+11.5*
Lorain, O. N3	*14.75*	*0.25*	*15.25*	*0.75*	*16.75*	*0.5*	*16.75*	*0.5*	....	....	....	....
Sharon, Pa. M6	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	....	....	....	....
Sparrows Pt., Md. B2	16.75	2.25	17.25	3.75	18.75	2.5	18.75	2.5	8.25	+8.5	8.25	+8.5
Wheatland, Pa. W9	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5
Youngstown R2, Y1	*14.75*	*0.25*	*15.25*	*0.75*	*16.75*	*0.5*	*16.75*	*0.5*	*6.25*	*+10.5*	*6.25*	*+10.5*

*Galvanized pipe discounts based on current price of zinc (10.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	21.25	26.00	....	34.50	....	40.50	42.50	46.75	43.25
202	22.75	29.00	35.00	37.50	39.25	41.25	43.25	47.25	47.25
301	22.25	27.00	35.75	35.75	40.25	42.50	44.50	49.25	45.75
302	24.25	30.25	36.50	39.00	41.00	43.25	45.50	50.00	50.00
302B	24.50	31.50	39.25	44.00	43.25	45.50	47.50	54.75	54.75
303	....	30.75	39.50	....	44.00	46.25	48.00	54.50	54.50
304	26.00	32.00	39.00	42.50	42.75	46.00	48.75	53.25	53.25
304L	....	....	46.50	49.50	51.25	53.50	56.25	60.75	60.75
305	27.50	35.25	40.75	45.75	43.75	46.00	49.25	56.50	56.50
308	29.50	36.75	45.50	48.25	50.75	53.50	58.00	60.50	60.50
309	38.25	47.50	55.50	62.00	61.25	64.50	68.25	77.50	77.50
310	47.75	59.25	75.00	81.00	83.25	87.50	89.25	93.00	93.00
314	....	....	....	....	83.25	....	80.25	....	100.50
316	38.25	47.50	59.75	66.50	66.75	70.25	73.75	78.25	78.25
316L	....	....	67.25	73.00	74.25	77.75	81.25	85.75	85.75
317	46.25	57.75	73.75	84.75	83.00	87.25	90.00	97.00	97.00
321	31.00	38.50	45.25	51.50	50.50	53.25	57.50	63.00	63.00
18-8 CbTa	35.50	44.75	53.50	61.00	59.25	62.25	67.00	76.25	76.25
403	....	....	30.75	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	33.00	40.25	37.75	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	32.00	33.50	35.25	49.75	49.75
431	....	27.75	36.25	....	40.50	42.50	44.25	53.75	53.75
446	....	....	37.75	55.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
302	....	....	....	....	35.50
304	33.15	36.20	40.30	44.50	37.75
304-L	35.40	38.80	43.15	47.65	....
316	38.35	41.60	45.90	50.15	55.50
316-L	43.55	47.60	52.70	57.85	....
316-Cb	43.85	48.10	53.40	58.75	....
321	34.90	37.95	42.10	46.40	44.75
347	37.05	41.25	46.45	51.70	54.25
405	27.55	29.20	33.15	37.05	....
410	27.00	28.70	32.65	36.55	....
430	27.00	28.70	32.65	36.55	....
Inconel	47.28	57.90	68.50	79.20	....
Nickel	40.00	50.30	60.65	71.05	....
Nickel, Low Carbon	40.30	50.95	61.65	72.50	....
Monel	41.70	51.90	62.15	72.40	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	35.00	39.85

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	HI-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.170
18.25	4.25	1	4.75	....	2.385
18	4	2	9	....	2.755
18	4	2	....	....	1.845
18	4	1	....	....	1.680
9	3.5	..	....	....	1.275
13.5	4	3	....	....	1.945
13.75	3.75	2	5	....	2.325
6.4	4.5	1.9	....	5	1.185
6	4	3	....	6	1.430
1.5	4	1	....	8.5	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59 00‡	63.00	....
Woodward,Ala. W15	58.50**	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	64.50	65.00	65.50	66.00
Tonawanda,N.Y. W12	64.50	65.00	65.50	66.00
N.Tonawanda,N.Y. T9	....	65.00	65.50	66.00
Boston, deld.	75.79	76.29	76.79	....
Rochester,N.Y., deld.	67.52	68.02	68.52	....
Syracuse,N.Y., deld.	68.62	69.12	69.62	....
Chicago District				
Chicago I-3	64.50	65.00	65.00	65.50
S.Chicago Ill. R2	64.50	....	65.00	....
S.Chicago,Ill. Y1	64.50	65.00	65.00	....
S.Chicago,Ill. W14	64.50	....	65.00	65.50
Milwaukee, deld.	66.96	67.46	67.46	67.96
Muskegon,Mich., deld.	....	78.83	78.83	....
Cleveland District				
Cleveland R2, A7	64.50	65.00	65.00	65.50
Akron,O., deld.	67.62	68.12	68.12	68.62
Mid-Atlantic District				
Birdsboro,Pa. B10	66.50	67.00	67.50	68.00
Chester,Pa. P4	66.50	67 00	67 50	....
Swedeland,Pa. A3	66.50	67.00	67 50	68.00
New York, deld.	....	73.20	73 70	....
Newark,N.J., deld.	70.52	71.02	71 52	72.02
Philadelphia, deld.	68.38	68.88	69.38	69.88
Troy,N.Y. R2	66.50	67.00	67.50	68.00
Pittsburgh District				
NevilleIsland, Pa. P6	64.50	65.00	65.00	65.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	66.45	66.45	66.98
McKeesRocks,Pa., deld.	....	66.10	66.10	66.63
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	66.76	66.76	67.29
Verona,Trafford,Pa., deld.	66.79	67.32	67.32	67.85
Brackenridge,Pa., deld.	67.10	67.60	67.60	68.13
Midland,Pa. C18	64.50	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	65.00	....
Sharpsville,Pa. S6	64.50	....	65.00	65.50
Youngstown Y1	....	....	65.00	65.50
Mansfield,O., deld.	69.40	....	69.90	70.40
Duluth I-3	64.50	65.00	65.00	65.50
Erie,Pa. I-3	64.50	65.00	65.00	65.50
Everett, Mass. E1	66.50	67.00	67.50	....
Fontana,Calif. K1	72.50	73.00	....	....
Geneva,Utah C11	64.50	65.00	....	....
GraniteCity,Ill. G4	66.40	66.90	67.40	....
Ironton,Utah C11	64.50	65.00	....	....
Minnequa,Colo. C10	66.50	67.00	67.50	....
Rockwood,Tenn. T3	....	59 00‡	63.00	....
Toledo,O. I-3	64.50	65.00	65.00	65.50
Cincinnati, deld.	71.04	71.54	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.60%, $59.50.
‡Phos. 0.70-0.90%; Phos. 0.30-0.50%, $60.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O I-3, J1	77.25
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity Ky P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9. K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos 0.035% max)	78.50
Troy,N Y R2 (Phos. 0.035% max)	72.50
Philadelphia, deld.	80.26
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	69.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.17§	9.37§	9.83§	....	8.21	8.45	10.23	....	8.59	8.55	10.51
Baltimore	7.88	8.98	9.31	....	8.36	8.53	9.13§	14.68	8.75	8.26	9.76
Birmingham	7.80	9.00	9.52	....	7.82	8.07	10.12	....	8.20	8.16	10.31
Boston	8.84	9.88	9.24	60.42	8.89	9.07	....	14.69	9.10	9.18	10.68
Buffalo	7.85	9.00	10.68	....	8.05	8.25	8.70	14.50	8.50	8.50	10.05
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	7.78	9.00	9.65	53.25	7.82	8.07	8.35	14.15	8.20	8.16	9.49
Cincinnati	7.94	9.05	9.65	50.00	8.14	8.38	8.84	14.46	8.74	8.52	9.78
Cleveland	7.78	8.98	9.55	53.43	7.92	8.16	8.60	14.24	8.57	8.39	9.72
Denver	9.70	11.30	12.49	....	9.80	9.95	10.65	18.89	9.80	9.70	11.40
Detroit	8.03	9.25	10.00	59.50	8.17	8.37	8.70	14.41	8.74	8.51	9.74
Erie, Pa.	7.85	9.00	9.60§§	....	7.95	8.20	8.70§§	....	8.50	8.35	9.75
Houston	8.80	9.75	10.99	....	7.75	8.05	10.65	15.00	8.00	8.80	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.10	10.30	11.25	57.45	9.15	9.20	12.10	15.50	9.15	9.65	11.80
Milwaukee	7.93	9.13	9.93	....	7.95	8.20	8.58	14.28	8.41	8.29	9.62
Moline, Ill.	8.13	9.35	10.05	....	8.17	8.42	8.70	....	8.55	8.51	...
New York	8.45	9.66	10.21	60.20	8.90	9.01	....	14.59	8.91	9.01	10.31
Norfolk, Va.	8.05	...	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.15	9.07	10.24	50.69	8.82	8.71	9.31	14.51	8.70	8.68	9.70
Pittsburgh	7.78	8.99	10.00	50.00	7.92	8.07	8.60	14.15	8.20	8.16	9.49
Portland, Oreg.	9.20	11.20	11.55	55.20	11.05‡‡	9.35	13.80	14.60	9.35	9.00	12.20
Richmond, Va.	8.00	...	10.14	....	8.55	8.40	10.60	....	8.95	8.40	9.90
St. Louis	8.14	9.34	10.16	73.36	8.19	8.43	8.96	14.51	8.67	8.52	9.86
St. Paul	8.39	9.59	10.26	....	8.43	8.68	9.21	....	8.94	8.90	10.10
San Francisco	9.05	10.40	10.65	53.45	9.05	9 15	12 55	15 60	9 15	9.30	11.55
Seattle	9.55	10.70	11.65	55.20	9.55	9.50	13.40	15.85	9.35	9.30	11.70
Spokane, Wash.	9.55	10.70	11.55	....	9.55	9.50	13.40	16.60	9.35	9.30	11.70
Washington	8.48	9.58	....	....	9.06	9.13	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 11.00c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **⅛-in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle; 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10 000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; §—400 to 999 lb; §§—1000 to 1999 lb; §§§—2000 to 3999 lb; §§§§—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beach Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Philadelphia, $137; Woodbridge, N.J., $135.

Ladle Brick (per 1000)

Dry Pressed: Aisey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $100; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Nario, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ⅛-in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ¾-in. grains with fines: Baltimore, $72.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60% $33-$36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $33-34; Mexican, all-rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	32.00-33.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$20.00-23.00
Domestic, concentrates mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account: other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00

Turkish

48% 3:1	$59.00-62.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$3.10-3.60
60-65%	3.60-3.80

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi river, ocean bags 23,000 lb and over	10.50
F.o.b. Riverton or Camden, N.J., west of Mississippi river.	9.50
Sponge Iron, domestic, 98 + % Fe: Deld. east of Mississippi river, 23,000 lb and over	10.50
F.o.b. Riverton, N.J., west of Mississippi river	9.50
Sponge Iron, Canadian: F.o.b. shipping point	9.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe	36.50
Unannealed (99+ % Fe)	36.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500 lb drum, fr'ght allowed Carlots	38.20
Ton lots	40.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	*32.60-39.40†*
Bronze, 5000-lb lots	*50.20-54.70†*
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.15
Nickel-Silver, 5000-lb lots	*50.80-55.40†*
Phosphor-Copper, 5000-lb lots	62.00
Copper (atomized) 5000-lb lots	44.50-52.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.08
Stainless Steel, 316	$1.44
Tin	14.50*
Zinc, 5000-lb lots 18.00-31.20‡	

Tungsten:	Dollars
Melting grade, 99%	
60 to 2000 mesh:	
1000 lb and over	3.75
Less than 1000 lb	3.90
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam.	Inches Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5½	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	17.50-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	33.78
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	29.27
Kearny, N.J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.14
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.80 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.13	$7.13	$7.13	$7.36
Bar Size Angles	*6.57*	*6.52*	*6.52*	*6.75*
Structural Angles	*6.57*	*6.52*	*6.52*	*6.75*
I-Beams	*6.82*	*6.77*	*6.77*	*7.00*
Channels	*6.82*	*6.77*	*6.77*	*7.00*
Plates (basic bessemer)	9.00	9.00	9.00	9.30
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.62	26.62	26.62	27.77
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.95	6.95	6.95	7.30
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods Thomas Commercial No. 5	6.38	6.38	6.38	6.78
Wire Rods, O.H. Cold Heading Quality No. 5	6.72	6.72	6.72	7.12
Bright Common Wire Nails (§)	8.38	8.38	8.38	8.58

†Per 82-lb, net, reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb of contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, SM x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk, 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 6Sc; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 20.00c per lb of Si. Packed, c.l. 21.65c, ton lot 22.95c, less ton 23.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

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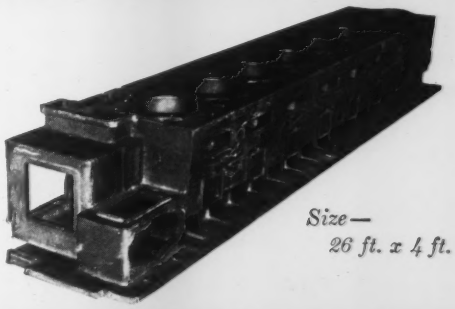
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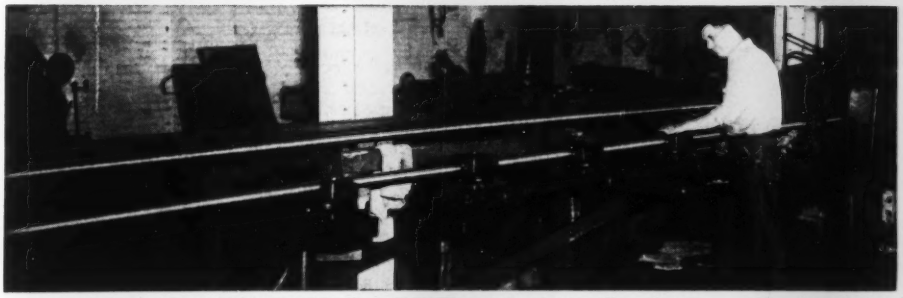
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Vacation Lull Hits Scrap Market

Prices slip for first time in weeks as seasonal factors cut demand from steelworks and foundries. STEEL's index on the prime grades declines to $55.33, down 50 cents

Scrap Prices, Page 150

Philadelphia—With little interest by buyers or sellers, scrap prices eased last week. No. 1 heavy melting is off to $56, delivered, No. 1 bundles to $57, No. 2 bundles to $47, and No. 1 busheling to $57. Also, heavy turnings are easier at $52, delivered, and rail crops at $69-$71.

With the July 4 holiday week over, an early strengthening is indicated. Some consumer plants and yards, which were down for mass vacations, will be resuming this week. Trading for export is already increasing. At least three cargoes will be leaving this port this month.

Prices on No. 2 heavy melting remained steady at $48-$49, delivered, throughout the past week, and a number of other grades, including cast, held unchanged.

New York—Brokers last week dropped their buying prices on several grades, now offering $52-$53 for No. 1 heavy melting and No. 1 bundles, $42-$43 for No. 2 heavy melting, and $41-$42 for No. 2 bundles. They also reduced their offerings $1 a ton on machine shop turnings and mixed borings and turnings to $28-$28.50, and on short shoveling turnings to $30-$31. But with the July 4 holiday period over, some early strengthening in the market is expected.

Pittsburgh—Buyer resistance is developing following the extended increase in scrap prices. More scrap is being offered. But several mills plan slowdowns for repairs or because of declining demand. Mills are buying more of the leading scrap grades than they require in expectation of higher prices in late third quarter. But No. 2 bundles are no longer being purchased in large volume. No. 1 heavy melting is being purchased at $57, off $1 from last week, while No. 2 bundles are $47, down $3.

Detroit—The short week is causing buyers to hold out of the market, and some resistance to the higher prices seems to be building up. Latest purchases were at prices $1 and $2 above those a week ago.

Chicago—Prices are holding for the most part at levels set last week when reductions of $1 to $3 a ton were made. A large mill announced $55 as its price for No. 1 heavy melting industrial material. It is figured July will be a quiet month. With the steelmaking rate still trending off, mill buying will be light. Supply of dealer scrap is sufficient to remove price pressure. Brokers are able to purchase enough tonnage to fill old orders. Generation of industrial scrap will shrink sharply this month while manufacturing plants are closed for vacations. Demand for cast grades lags.

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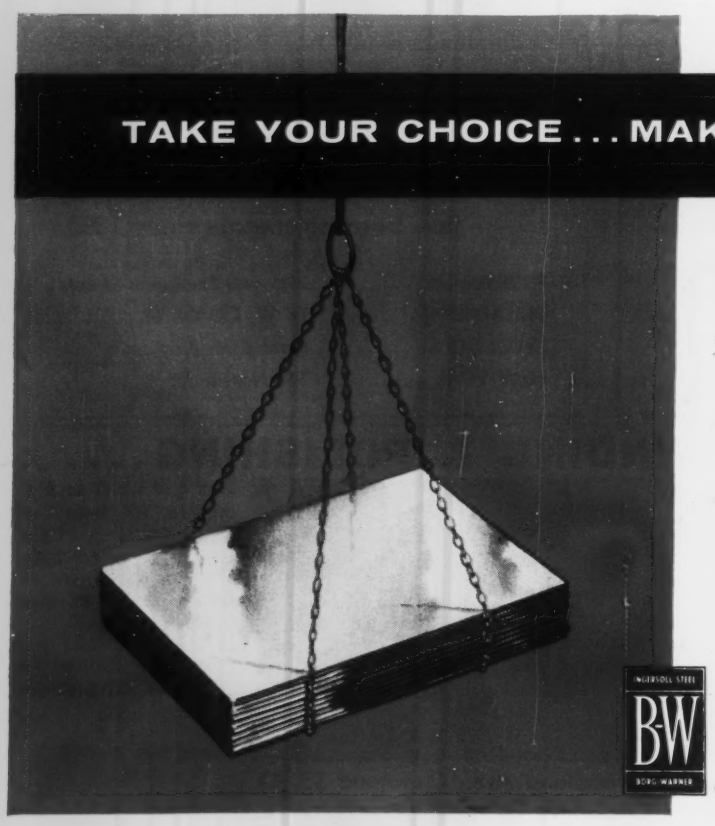

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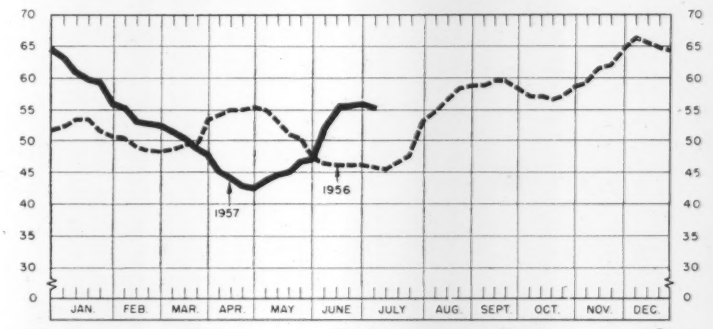
STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania—Compiled by STEEL



July 2 1957	Week Ago	Month Ago	Year Ago	June Avg.
$55.33	$55.83	$52.33	$45.83	$54.89

Cincinnati—Prices on the principal steelmaking grades moved up $5 a ton on July shipment tonnage as a local mill entered the market for substantial tonnage. No. 1 heavy melting is quoted $51-$52, No. 2 heavy melting $44-$45, No. 1 bundles, $51-$52, No. 2 bundles $42-$43, No. 1 busheling $51-$52, machine shop turnings $32-$33, mixed borings and turnings $30-31, short shoveling turnings $35-$36, cast iron borings $30-$31, low phos $56-57 and No. 1 railroad heavy melting $55-56.

Buffalo — Despite weakness in some market centers, Buffalo area scrap prices continue firm. Some observers expect a slight advance when July mill orders are placed.

Cleveland — Holiday shutdowns and vacation suspensions were reflected in sluggish demand in the scrap market last week. Expectations are that July will be a slow month but that buying will swell substantially in August. Despite the sluggishness, the tone of the market is somewhat stronger.

St. Louis—There is more activity in the local scrap market, especially in the railroad grades. A sizable offering by the Frisco confirmed an advance on those grades started a week earlier by the Missouri Pacific list. New buyers are entering the market.

Birmingham—The scrap market is steady. Buying resumed when industrial and railroad lists were released and showed no declines. One railroad quoted No. 1 heavy melting up $3 a ton. Dealers who had been showing little interest in feelers at lower prices now appear willing to ship at the going market. Exporters are buying again. Many metalworking plants in the area are down for vacations.

Los Angeles — Prices are unchanged, but seasonal factors are expected to slow down buying noticeably. Shortages in northern California have not particularly affected this market area.

Seattle—Steel scrap is stronger, advances of $3 to $4 being made last week. Receipts have lagged recently. Cast iron scrap is weaker, reflecting a slower export demand. Export prices are down around $3. Exporters expect little improvement in Japanese demand the remainder of this year. Japan is short of dollars, and her heavy imports in the first half of the year just about exhausted her quota. Charters for prior commitments for delivery to Japan are reported, but overseas rates are practically half those of six months ago.

Washington—Domestic consumption of ferrous materials (scrap and pig iron) in April totaled 11,679,000 gross tons, reports the U.S. Bureau of Mines. The melt consisted of 49.8 per cent scrap (5,821,000 tons) and 50.2 per cent pig iron (5,858,000 tons). This compares with 50.5 per cent scrap and 49.5 per cent pig iron in March.

Domestic stocks of ferrous scrap held by consumers at the end of April were 6,583,000 gross tons. Stocks of pig iron totaled 2,275,-

(*Please turn to page* 155)

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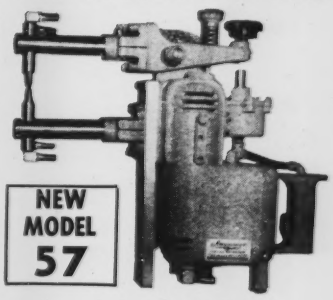

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, July 2, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 2	$55.33
June 26	55.83
June Avg.	54.89
July 1956	47.70
July 1952	42.60

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*56.00-57.00*
No. 2 heavy melting	51.00-52.00
No. 1 factory bundles	*61.50-62.50*
No. 1 dealer bundles	*56.00-57.00*
No. 2 bundles	*46.00-47.00*
No. 1 busheling	*56.00-57.00*
Machine shop turnings	*33.00-34.00*
Mixed borings, turnings	*33.00-34.00*
Short shovel turnings	*37.00-38.00*
Cast iron borings	*37.00-38.00*
Cut structurals:	
2 ft and under	63.00-64.00
3 ft lengths	62.00-63.00
Heavy turnings	*49.00-50.00*
Punchings & plate scrap	62.00-63.00
Electric furnace bundles	62.00-63.00

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	34.00-35.00
No. 1 machinery cast	*56.00-57.00*

Railroad Scrap

No. 1 R.R. heavy melt.	61.00-62.00
Rails, 2 ft and under	*70.00-71.00*
Rails, 18 in. and under	*71.00-72.00*
Rails, random lengths	68.00-69.00
Railroad specialties	69.00-70.00

Stainless Steel Scrap

18-8 bundles & solids	300.00-315.00
18-8 turnings	190.00-215.00
430 bundles & solids	75.00-80.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	51.00-52.00
No. 2 heavy melting	46.00-47.00
No. 1 factory bundles	*55.00-56.00*
No. 1 bundles	51.00-52.00
No. 2 bundles	43.00-44.00
No. 1 busheling	51.00-52.00
Machine shop turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Mixed borings, turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut foundry steel	49.00-50.00
Cut structurals, plates 2 ft and under	58.00-59.00
Low phos. punchings & plate	54.00-55.00
Alloy free, short shovel turnings	26.00-27.00
Electric furnace bundles	54.00-55.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	41.00-42.00
Heavy breakable cast	41.00-42.00
Stove plate	50.00-51.00
Unstripped motor blocks	37.00-38.00
Brake shoes	41.00-42.00
Clean auto cast	54.00-55.00
Burnt cast	39.00-40.00
Drop broken machinery	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt.	57.00-58.00
R.R. malleable	61.00-62.00
Rails, 2 ft and under	73.00-74.00
Rails, 18 in. and under	74.00-75.00
Rails, random lengths	68.00-69.00
Cast steel	63.00-64.00
Railroad specialties	65.00-66.00
Uncut tires	63.00-64.00
Angles, splice bars	65.00-66.00
Rails, rerolling	71.00-72.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	300.00-310.00
18-8 turnings	200.00-210.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	54.00-55.00
No. 2 heavy melting	49.00-50.00
No. 1 bundles	54.00-55.00
No. 2 bundles	46.00-47.00
No. 1 busheling	54.00-55.00
Machine shop turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	*59.00-60.00*
Electric furnace bundles	57.00-58.00

Railroad Scrap

No. 1 R.R. heavy melt.	61.00-62.00

CHICAGO

No. 1 heavy melt., indus.	54.00-55.00
No. 1 hvy melt., dealer	52.00-53.00
No. 2 heavy melting	44.00-45.00
No. 1 factory bundles	57.00-58.00
No. 1 dealer bundles	52.00-53.00
No. 2 bundles	41.00-42.00
No. 1 busheling, indus.	54.00-55.00
No. 1 busheling, dealer	52.00-53.00
Machine shop turnings	*32.00-33.00*
Mixed borings, turnings	*34.00-35.00*
Short shovel turnings	*34.00-35.00*
Cast iron borings	*34.00-35.00*
Cut structurals, 3 ft.	*56.00-57.00*
Punching & plate scrap	*57.00-58.00*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Stove plate	45.00-46.00
Unstripped motor blocks	35.00-36.00
Clean auto cast	51.00-52.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	56.00-57.00
R.R. malleable	62.00-63.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Angles, splice bars	67.00-68.00
Rails, rerolling	74.00-75.00

Stainless Steel Scrap

18-8 bundles & solids	*320.00-325.00*
18-8 turnings	*220.00-225.00*
430 bundles & solids	75.00-80.00
430 turnings	55.00-60.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*46.00-47.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	46.00-47.00
No. 2 bundles	*34.00-35.00*
No. 1 busheling	*46.00-47.00*
Machine shop turnings	27.00-28.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	29.00-30.00
Punchings & plate scrap	56.00-57.00

Cast Iron Grades

No. 1 cupola	*48.00*
Charging box cast	41.00
Stove plate	*42.00*
Heavy breakable	*38.00*
Unstripped motor blocks	28.00
Clean auto cast	*50.00*
Malleable	52.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	45.50
No. 2 heavy melting	43.00
No. 1 bundles	45.50
No. 2 bundles	38.00
No. 1 busheling	45.50
Machine shop turnings	30.00
Short shovel turnings	32.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	40.00
Heavy breakable cast	40.00
Unstripped motor blocks	40.00
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	*42.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*57.00*
Rails, 18 in. and under	74.00
Rails, rerolling	72.00
Rails, rerolling	*68.00*
Angles, splice bars	62.00

PHILADELPHIA

No. 1 heavy melting	*56.00*
No. 2 heavy melting	48.00-49.00
No. 1 bundles	*57.00*
No. 2 bundles	*47.00*
No. 1 busheling	*57.00*
Electric furnace bundles	59.00
Mixed borings, turnings	40.00†
Short shovel turnings	42.00
Machine shop turnings	39.00
Heavy turnings	*52.00*
Structurals & plate	59.00-61.00
Couplers, springs, wheels	66.00
Rail crops, 2 ft & under	*69.00-71.00*

Cast Iron Grades

No. 1 cupola	49.00
Heavy breakable cast	55.00
Malleable	62.00
Drop broken machinery	57.00-58.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*52.00-53.00*
No. 2 heavy melting	*42.00-43.00*
No. 1 bundles	*52.00-53.00*
No. 2 bundles	*41.00-42.00*
Machine shop turnings	*28.00-28.50*
Mixed borings, turnings	*28.00-28.50*
Short shovel turnings	*30.00-31.00*
Low phos. (structural & plate)	55.00-56.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	39.00-40.00
Heavy breakable	46.00-47.00

Stainless Steel

18-8 shets, clips solids	280.00-290.00
18-8 borings, turnings	180.00-190.00
430 sheets, clips, solids	60.00-70.00
410 sheets, clips, solids	50.00-55.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	37.00-38.00
No. 1 bundles	43.00-44.00
No. 2 bundles	35.00-36.00
No. 1 busheling	42.00-43.00
Machine shop turnings	25.00-26.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	30.00-31.00
No. 1 cast	34.00-35.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	46.00-47.00
No. 2 bundles	36.00-37.00
No. 1 busheling	46.00-47.00
Mixed borings, turnings	35.00-36.00
Machine shop turnings	33.00-34.00
Short shovel turnings	36.00-37.00
Cast iron borings	35.00-36.00
Low phos.	53.00-54.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
No. 1 machinery	50.00-51.00

Railroad Scrap

Rails, random lengths	61.00-62.00
Rails, 3 ft and under	66.00-67.00
Railroad specialties	59.00-60.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*51.00-52.00*
No. 2 heavy melting	*44.00-45.00*
No. 1 bundles	*51.00-52.00*
No. 2 bundles	*42.00-43.00*
No. 1 busheling	*51.00-52.00*
Machine shop turnings	*32.00-33.00*
Mixed borings, turnings	*30.00-31.00*
Short shovel turnings	*35.00-36.00*
Cast iron borings	*30.00-31.00*
Low phos. 18 in.	*56.00-57.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	42.00-43.00
Charging box cast	42.00-43.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	*55.00-56.00*
Rails, 18 in. and under	70.00-71.00
Rails, random lengths	62.00-63.00

BIRMINGHAM

No. 1 heavy melting	*49.00-50.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*49.00-50.00*
No. 2 bundles	*37.00-38.00*
No. 1 busheling	*49.00-50.00*
Cast iron borings	28.00-29.00
Short shovel turnings	38.00-39.00
Machine shop turnings	37.00-38.00
Bar crops and plates	54.00-55.00
Structurals & plate	54.00-55.00
Electric furnace bundles	*50.00-51.00*
Electric furnace:	
3 ft and under	47.00-48.00
2 ft and under	48.00-49.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Unstripped motor blocks	43.00-44.00
Charging box cast	34.00-35.00
No. 1 wheels	*46.00-47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	53.00-54.00
Rails, 18 in. and under	65.00-66.00
Rails, rerolling	66.00-67.00
Rails, random lengths	59.00-60.00
Angles, splice bars	59.00-60.00

SEATTLE

No. 1 heavy melting	*49.00*
No. 2 heavy melting	*44.00*
No. 1 bundles	*44.00*
No. 2 bundles	*30.00*
Machine shop turnings	28.00
Mixed borings, turnings	28.00
Electric furnace No. 1	*54.00*

Cast Iron Grades

No. 1 cupola	*45.00*
Heavy breakable cast	*42.00*
Unstripped motor blocks	*35.50*
Stove plate (f.o.b. plant)	*30.00*

LOS ANGELES

No. 1 heavy melting	48.00
No. 2 heavy melting	43.00
No. 1 bundles	47.00
No. 2 bundles	34.00
Machine shop turnings	32.00
Shoveling turnings	34.00
Cast iron borings	32.00
Cut structural and plate, 1 ft and under	57.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	53.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00

SAN FRANCISCO

No. 1 heavy melting	48.00
No. 2 heavy melting	*46.00*
No. 1 bundles	47.00
No. 2 bundles	35.00
Machine shop turnings	32.00
Mixed borings, turnings	32.00
Cast iron borings	32.00
Heavy turnings	32.00
Short shovel turnings	34.00
Cut structurals, 3 ft	56.00

Cast Iron Grades

No. 1 cupola	53.00
Charging box cast	45.00-47.00
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	48.00
Clean auto cast	55.00
No. 1 wheels	48.00
Drop broken machinery	53.00

HAMILTON, ONT.

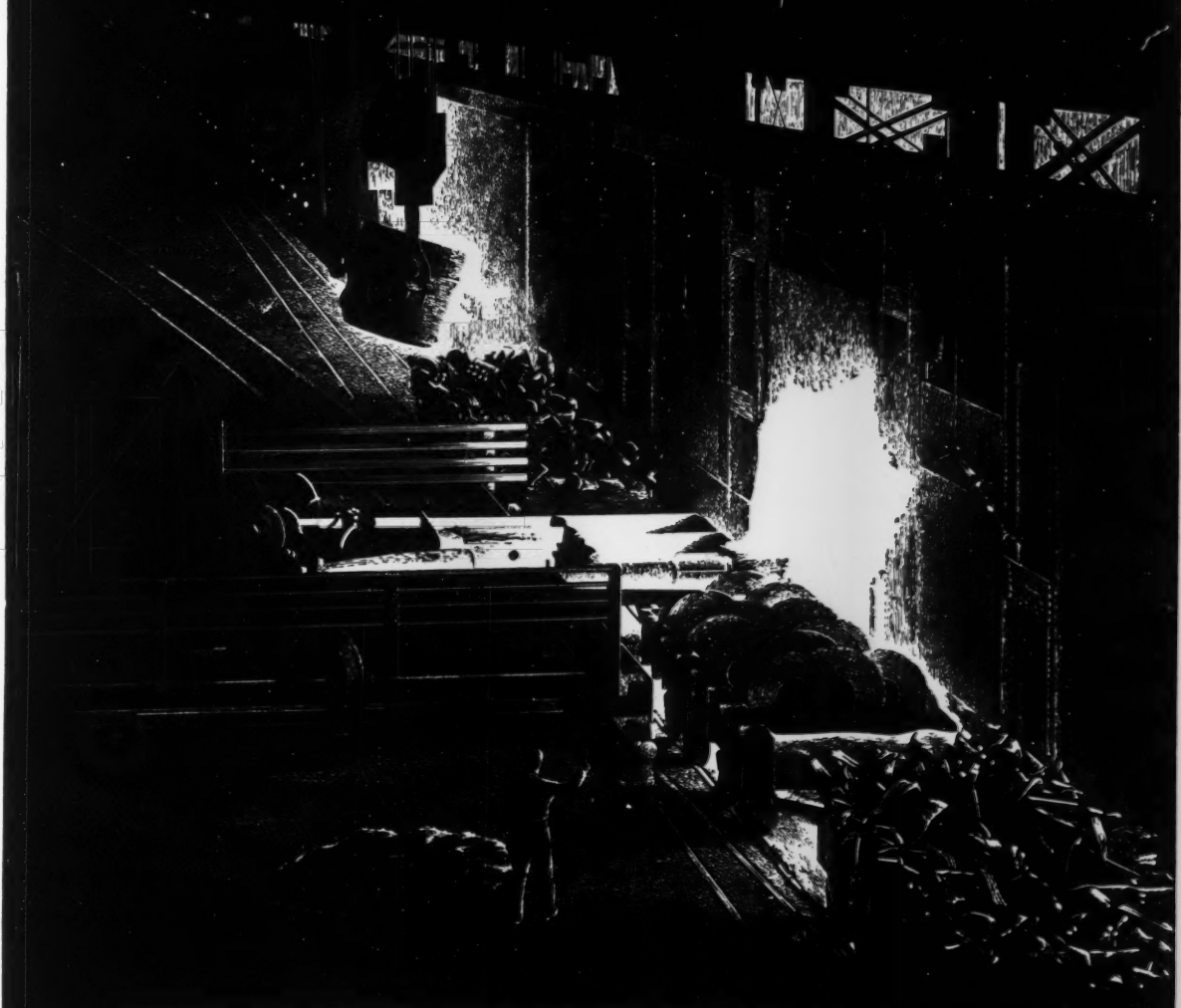
No. 1 heavy melting	43.00
No. 2 heavy melting	38.00
No. 1 bundles	43.00
No. 2 bundles	32.00
Mixed steel scrap	35.00
Mixed borings, turnings	19.00
Busheling, new factory: Prepared	43.00
Unprepared	37.00
Short steel turnings	30.00
Rails, rerolling	49.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

for the purchase or sale of **scrap**



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Prices Are on the Move

Scoreboard: Aluminum will go up; magnesium may follow. Both lead and zinc couuld tumble farther. Primary copper appears stable for the moment. Tin may weaken

Nonferrous Metal Prices, Pages 154 & 155

NONFERROUS prices could take off in all directions during the next few weeks. Some may dip, others rise.

Aluminum—Producers are all set to hike the price of pig aluminum soon after wage boosts (about 7 per cent) go into effect on Aug. 1. Best guess is 1 cent a pound.

Justification: Since 1939, producers say, labor has gone up 260 per cent; materials, 105 per cent; power, 77 per cent; freight rates, 104 per cent; taxes, 200 per cent; expansion, 201 per cent. Aluminum has risen only 25 per cent.

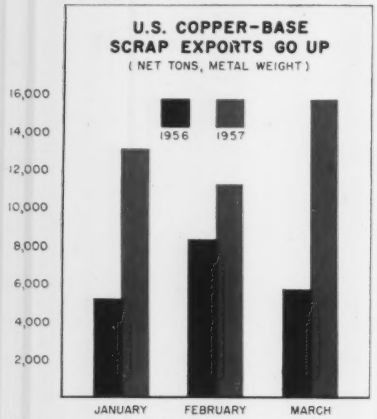
A pickup in demand is being felt by most producers. But the market is still extremely competitive. The current upsurge reflects the rock bottom inventories users have been operating on. Another reason for the current sales upswing: Inventory build-ups to beat the price hike.

Secondary ingot sales, the traditional barometer of an industry upsurge, are firming up rapidly.

Magnesium—A possible price increase is in the offing because of labor contracts which call for automatic pay hikes later this summer. Traditionally, the price on magnesium follows the pattern set by aluminum.

Lead, Zinc—On July 1, one custom smelter reduced the price of zinc 0.5 cent (to 10 cents a pound) in an effort to strengthen the market and buoy demand. Other companies indicated they would go along with the drop.

Recent cutbacks in zinc were "too little and too late," as one observer put it, to stem the price drop. Most dramatic of the cutbacks came from American Smelting & Refining Co., which suspended its mining operations at Colville, Wash., Crested Butte, Colo., and Vanadium, N. Mex. The company also closed down its mill at Deming, N. Mex., and cut production of high grade zinc by 30 per cent at its Corpus Christi, Tex., smelter. Earlier, Anaconda Co. suspended operations at its Darwin, Calif., zinc mines and concentrator.



Source: Bureau of the Census.

Whether the price drop will strengthen the zinc market is a matter for speculation. One thing's sure: Other producers will have to follow Asarco's lead if zinc is to stabilize soon.

One observer predicts a wave of curtailments shortly. Another believes the industry will adopt a "wait-and-see" attitude before cutting production more.

Lead sales are about medium for this time of year. A price decrease is still possible, but the U.S. and foreign markets have firmed recently. Forecast: Look for more production curtailments to bolster the present price.

Copper—There's little talk of additional reductions in the price of primary copper. Some sources think it has hit bottom. But no one is making definite predictions.

Custom smelted copper is another story. On July 1, one major producer cut the price 0.5 cent (to 28.5 cents a pound). Other leading smelters indicate they will have to meet it to compete.

Primary producers aren't too worried about this affecting their price line. They point out only 0.75 cent now separates the primary price (29.25 a pound) and the latest custom smelted price.

Some trade sources believe the market would become more stable if production were curtailed. But no major producer will admit that any such move is in the wind.

Tin — Canada's announcement that it intends to dispose of 3000 tons of tin stockpiled during the Korean War comes as a shock. This notice, on top of the British Board of Trade's decision to start selling 2500 tons in September, leads some observers to believe the market will be weakened.

But one source points out that Canada purchased its tin at a price higher than the current quotation and is not likely to sell at a loss. Canada itself says it plans to dispose of the tin in a "manner least likely to interfere with normal market practices."

NONFERROUS PRICE RECORD

	Price July 2	Last Change	Previous Price	June Avg.	May Avg.	July, 1956 Avg.
Aluminum	27.10	Aug. 10, 1956	25.90	27.100	27.100	25.900
Copper	28.50–29.25	July 1, 1957	29.00–29.25	30.250	31.087	40.030
Lead	13.80	June 11, 1957	14.80	14.120	15.185	15.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	33.750
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	97.875	July 1, 1957	97.625	98.080	98.341	96.435
Zinc	10.00–10.50	July 1, 1957	10.50	10.840	11.923	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

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This simple question made us realize that while we had a Payroll Savings Plan available we had not promoted it lately among our employees.

We contacted the State Director of the Savings Bonds Division of the U. S. Treasury and discussed this matter. He helped us work out a promotion plan to contact every employee on the Payroll, and thereafter, each new employee we hired. He supplied literature, posters and so forth and helped train the canvassers to do an educational promotion among our employees.

In a short time, with practically no disruption of our business, our campaign was successful. The enthusiastic response floored us. This proved to us employees *want* to save part of their pay and they welcome the convenient Payroll Savings Plan for buying U. S. Savings Bonds.

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Nonferrous Metals

Cents per pound, carlots except at otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots, 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 241, 30.50; No. 356, 28.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.00 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 29.25 deld. Conn. valley; 29.25 deld. Midwest; custom smelters, 28.50; lake, 29.25 deld.; fire refined, 29.00 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-110 nom. per troy oz.

Lead: Common, 13.80; chemical, 13.90; corroding, 13.90, St. Louis. New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 13 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (die casting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot or ingots for addition to cast iron, 74.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01.

Osmium: $80-100 per troy oz, nom.

Palladium: $23-24 per troy oz.

Platinum: $89-95 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $16.50 per lb, commercial grade.

Silver: Open market, 90.25 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $58.06 per lb; sheet, $45.36 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N.Y., spot, 97.875; prompt, 97.75.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.75 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.60.

Zinc: Prime Western, 10.00-10.50; brass special, 10.25-10.75; intermediate, 10.50-11.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.35-11.85; special high grade, 11.75-12.25 deld. Die casting alloy ingot No. 3, 14.25-14.75; No. 2, 15.25-15.75; No. 5, 14.75-15.25 deld.

Zirconium: Sponge, commercial grade, $10 per lb.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.25-29.00; No. 12 foundry alloy (No. 2 grade), 21.25-22.50; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 24.25-25.75; 108 alloy, 21.75-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.00; grade 2, 21.25; grade 3, 20.25; grade 4, 19.50.

Brass Ingot: Red brass, No. 115, 29.50; tin bronze, No. 225, 39.00; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 24.00; manganese bronze, No. 421, 27.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.77, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 34.605; l.c.l, 35.23. Weatherproof, 30,000-lb lots, 35.72; l.c.l., 36.47. Magnet wire deld., 15,000 lb or more, 41.93; l.c.l., 42.68.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.50 per cwt; pipe, full coils, $19.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $18.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.50-53.30	42.80
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.30
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	55.4	62.5

*24-48 in. width or diam., 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59.70	57.20	....	73.00
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-Finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	56.10
Rolled				
1.125-1.500	55.20	53.90	59.00	56.10
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick, width 0.0750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$18.75	2	$ 57.00
1	29.00	4	157.20
1¼	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	43.10-44.60	57.80-61.80
12-14	43.40-44.80	58.40-62.70
15-17	43.60-45.40	59.60-64.30
18-20	44.10-45.80	61.50-66.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.00-13.50; old sheets, 9.50-10.00; borings and turnings, 6.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	51.38b	48.61c	....	51.57	25.250	25.250	24.500
Yellow Brass	44.69	32.87d	45.23	47.60	19.125	18.875	17.375
Low Brass, 80%	47.40	47.34	47.94	50.21	21.375	21.125	20.625
Red Brass, 85%	48.36	48.30	48.90	51.17	22.250	22.000	21.500
Com. Bronze, 90%	49.86	49.80	50.40	52.42	23.125	22.875	22.375
Manganese Bronze	52.52	46.69	57.19	....	17.625	17.375	16.875
Muntz Metal	46.94	42.75	....	....	17.875	17.625	17.125
Naval Brass	48.85	43.16	55.91	52.26	17.625	17.375	16.875
Silicon Bronze	55.96	55.15	56.00	57.97e	24.750	24.500	24.750
Nickel Silver, 10%	61.52	63.85g	63.85	....	25.750	25.000	12.875
Phos. Bronze, A-5%	70.47	70.97	70.97	72.15	26.250	26.000	25.000

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

7.00; crankcases, 9.50-10.00; industrial castings, 9.50-10.00.

Copper and Brass: No. 1 heavy copper and wire, 20.50-21.00; No. 2 heavy copper and wire, 19.00-19.50; light copper, 16.75-17.25; No. 1 composition red brass, 18.50-19.00; No. 1 composition turnings, 18.00-18.50; yellow brass turnings, 10.75-11.25; new brass clippings, 17.00-17.50; light brass, 10.50-11.00; heavy yellow brass, 12.50-13.00; new brass rod ends, 14.50-15.00; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 14.50-15.00; brass pipe, 15.50-16.00.

Lead: Heavy 9.50-10.00; battery plates, 4.50; linotype and stereotype, 11.50-12.00; electrotype, 10.00-10.50; mixed babbitt, 11.00-11.50.

Monel: Clippings, 45.00-53.00; old sheets, 44.00-53.00; turnings, 35.00-43.00; rods, 45.00-53.00.

Nickel: Sheets and clips, 85.00-90.00; rolled anodes, 85.00-90.00; turnings, 70.00-75.00; rod ends, 85.00-90.00.

Zinc: Old zinc, 3.00; new die-cast scrap, 2.75-3.00; old die-cast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.50-17.50; 3003 clippings, 16.50-17.50; 6151 clippings, 17.00; 5052 clippings, 16.50-17.00; 2014 clippings, 16.00-16.50; 2017 clippings, 16.00-16.50; 2024 clippings, 16.00-16.50; mixed clippings, 15.50; old sheets, 13.50-14.00; old cast, 13.50-14.00; clean old cable (free of steel), 16.00-17.00; borings and turnings, 14.00-15.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 24.50; No. 2 heavy copper and wire, 22.50; light copper, 20.25; refinery brass (60% copper) per dry copper content, 21.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 24.50; No. 2 heavy copper and wire, 22.50; light copper, 20.25; No. 1 composition solids, 21.50; heavy yellow brass solids, 15.50; yellow brass turnings, 14.50; radiators, 16.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 47.54; oval 45.75, 5000-10,000 lb; electrodeposited, 39.50, 2000-5000 lb lots; cast, 41.00, 5000-10,000 quantities.

Nickel: Depolarized, less than 100 lb, 101.50; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 116.50; 200-499 lb, 115.00; 500-999 lb, 114.50; 1000 lb or more, 114.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums. **Chromic Acid:** 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30, f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 74.80; 300-900 lb, 72.80.

Copper Sulphate: 100-1900 lb, 15.20; 2000-5900 lb, 13.20; 6000-11,900 lb, 12.95; 12,000-22,900 lb, 12.70; 23,000 lb or more, 12.20.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400 lb, 43.50; 5000 lb, 41.50; 10,000 lb, 40.50.

Nickel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 300 lb, 37.50; 400-4900 lb, 35.50; 5000-29,900 lb, 33.50; 30,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 400 lb, 22.80; 1000 lb, 21.80; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 77.40; 100-600 lb, 68.20; 700-1900 lb, 65.50; 2000-9900 lb, 63.60; 10,000 lb or more, 62.3.

Stannous Chloride (anhydrous): Less than 25 lb, 167.10; 25 lb, 132.10; 100 lb, 117.10; 400 lb, 114.70; 5200-19,600 lb, 102.50; 20,000 lb or more, 90.30.

Stannous Sulphate: Less than 50 lb, 129.80; 50 lb, 99.80; 100-1900 lb, 97.80; 2000 lb or more, 95.80.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from page* 149)

000 tons. Scrap stocks at the end of March were 6,572,422; pig iron, 2,177,658 tons.

Iron Ore . . .

Iron Ore Prices, Page 145

Receipts of iron ore and ore agglomerates in May totaled 17,132,266 gross tons, reports the American Iron Ore Association. This compares with 16,549,973 tons in May a year ago. Of total ore receipts in the month, 11,966,296 tons were U.S. Lake Superior, against 11,864,389 a year ago; 1,823,444 tons, other U.S., against 1,626,272; Canadian Lake Superior, 501,863, against 358,185; other Canadian, 885,262, against 1,106,930; foreign (except Canada), 1,955,401, against 1,594,197 tons.

Cumulative ore receipts this year through May were 34,134,955 tons against 35,118,188 in the like period last year. Breakdown: Lake Superior, 15,433,468 tons, against 17,288,396 a year ago; other U.S., 8,558,842, against 8,668,291; Canadian Lake Superior, 725,062, against 555,166; other Canadian,

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   OR
2. Build and operate complete job galvanizing facilities in your city.
   OR
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Positions Wanted

TWENTY-NINE YEARS CONTINUOUS EXPERIENCE in fabricated structural steel, plate work, miscellaneous and ornamental iron work, stainless steel and aluminum. Thoroughly experienced in all phases of sales, estimating, design and production. Capable of taking complete charge any one or all departments. Age 49 years, married, best references. Prefer location in South or West. Could be available in 30 days. Write Box 564, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Qualifications: B.S. Degree in Metallurgical Engineering or in Chemical Engineering. Age to 30 years.

Salary commensurate with ability. 37½ hours per week. Excellent benefits.

Fine opportunity for advancement.

Send resume to:
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INDUSTRIAL ENGINEERS

Our $194 million expansion program which will soon double our steelmaking capacity, has created opportunities in industrial engineering for young men trained or experienced in wage incentive programing, methods engineering, and statistical quality control.

2 to 5 years experience desired. Professional status assured. Openings at our Fontana plant in Southern California.

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Long established producer in Western Pennsylvania is expanding specialty steel operations.

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Applicant should have thorough knowledge of alloy and stainless steels.

This position offers real challenge and opportunity. Top salary and pension plan.

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Box 569, STEEL
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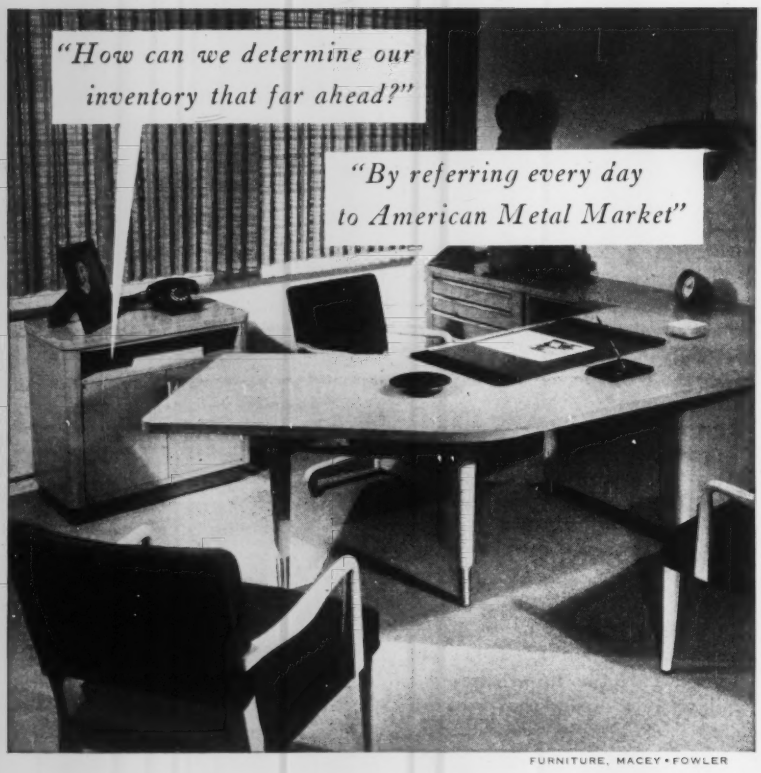
PLATE BENDING ROLLS

Initial pinch type, 10′ or longer, drop end, motor drive. In reply give name, age, condition, price, and other details.

Box 568, STEEL
Penton Bldg. Cleveland 13, Ohio



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American Metal Market

1882 • 1957 75th ANNIVERSARY

18 Cliff St., New York 38, N.Y.

THE DAILY NEWSPAPER OF THE STEEL AND METAL INDUSTRIES. ESTABLISHED 1882

1,249,534, against 1,407,010; foreign, 8,168,049, against 7,199,325.

Stocks on furnace yards and docks at the end of May totaled 33,352,441, against 31,621,394 a year ago. They broke down: U.S. Lake Superior, 21,758,400, against 23,422,444 a year ago; other U.S., 3,417,246, against 2,556,489; Canadian Lake Superior, 953,702, against 587,802; other Canadian, 2,626,021, against 1,790,158; foreign, 4,597,072 against 3,264,501.

Consumption totaled 11,472,198 tons in May, against 11,347,957 in the like month last year. Breakdown: Lake Superior, 7,059,342, against 7,641,430 a year ago; other U.S., 1,806,159, against 1,540,430; Canadian Lake Superior, 315,360, against 274,627; other Canadian, 763,376, against 600,703; foreign, 1,527,961, against 1,290,767.

Cumulative consumption through May was: 57,520,399 tons, compared with 56,836,801 tons in the like period of 1956. Breakdown: U.S. Lake Superior, 35,397,955, against 37,236,193 a year ago; other U.S., 8,180,001, against 8,573,892; Canadian Lake Superior, 1,728,125, against 1,503,316; other Canadian, 3,887,938, against 2,580,193; foreign, 8,326,380, against 6,943,207.

Pig Iron . . .

Pig Iron Prices, Page 144

A little better movement of merchant pig iron is anticipated now that the July 4 holiday week is past. Many foundries are still down for vacations and a generally spotty demand situation is likely to prevail over the next several weeks. Most iron sellers do not look for any substantial pickup in buying until after Labor day.

July volume is expected to slip below that of June in Chicago, but a pickup is indicated for August. One indication that steelmaking activity soon will be looking up in the Chicago area is that blast furnace operations there have turned up. During most of May and June, only 37 of the district's 43 stacks were active. The figure now is 39 with U.S. Steel having resumed production at its No. 1 stack at Gary on June 15 and Youngstown Sheet & Tube returning its No. 3 stack at South Chicago to production June 20.

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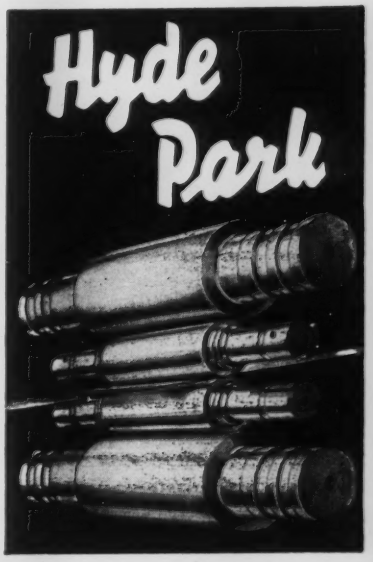

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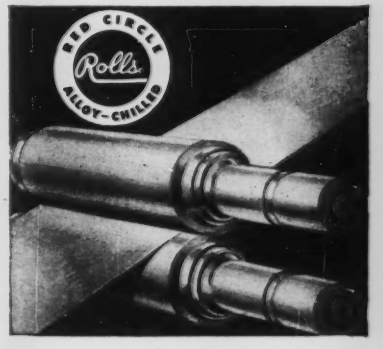
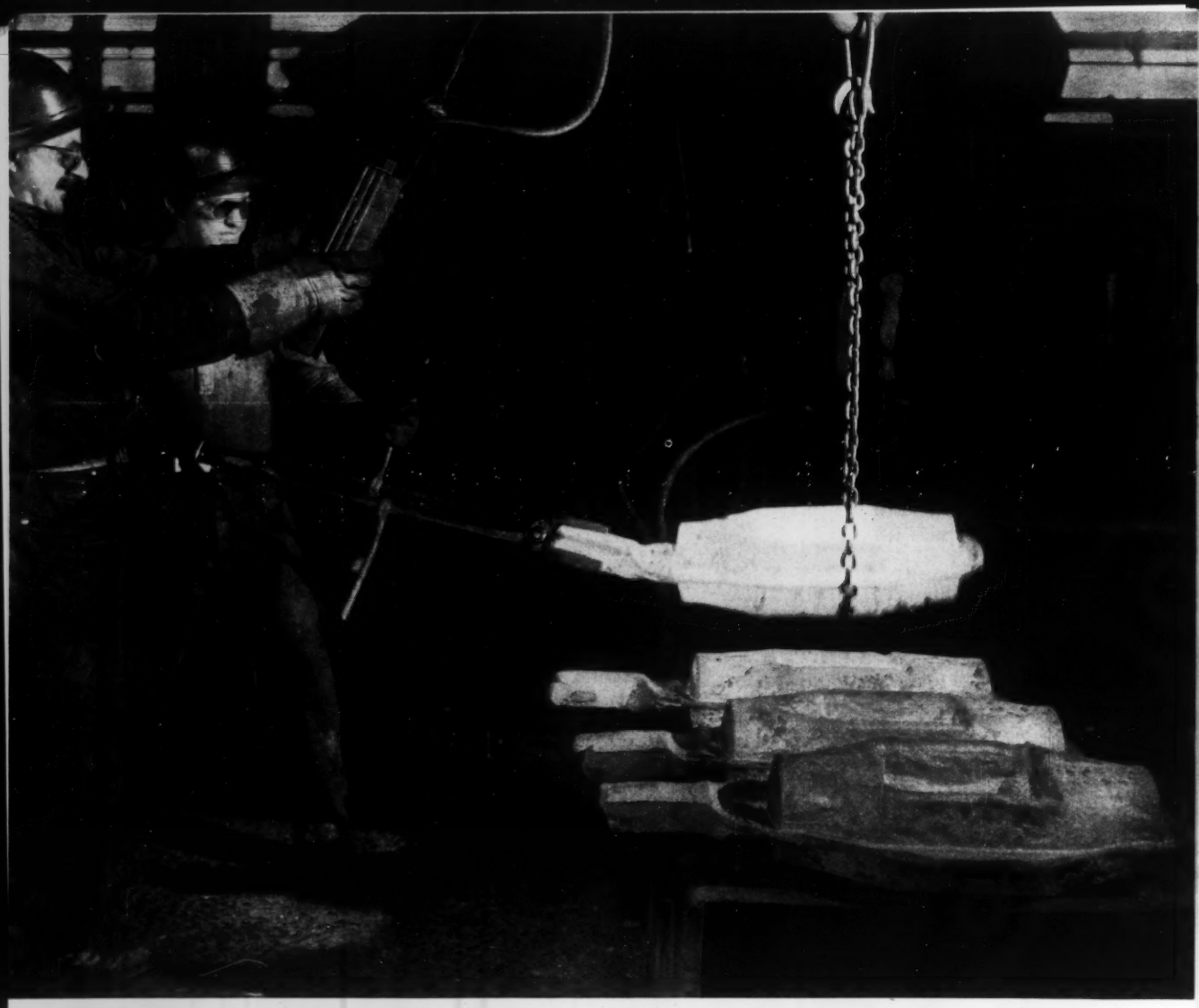




This Time It Was Turnbuckles

One thing that makes drop forging an interesting business is the immense variety of items that come from the hammers. On Monday it may be steam-trap bodies, hand wrenches, and cranks. On Tuesday perhaps spring hangers, parts for oil-well bits, gear blanks, strut forgings. The rest of the week, almost anything you can think of within the limits of drop-forge capacity.

Bethlehem has manufactured so many types of drop forgings that it's impossible to list them all. When the photograph above was taken, some turnbuckles were having their inning. The picture shows you a few of the rough forgings just after leaving the hammer. Each weighed better than 200 lb.

These were relatively large pieces, but Bethlehem often makes drop forgings that run heavier—and of course, many that are smaller. Our range is from approximately one lb to 250 lb; our range of designs, just about limitless.

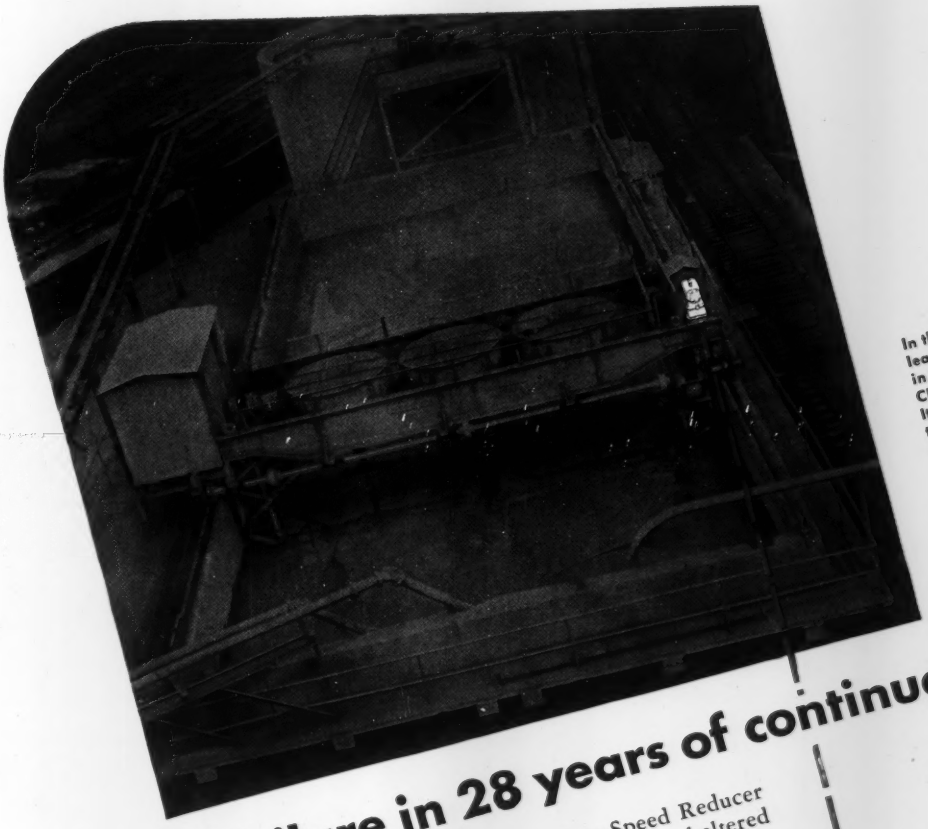
Your inquiries for any types of closed-die forgings will be handled promptly, and you can expect full cooperation from our engineering staff.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



In this photograph taken at a leading portland cement plant in Tennessee, you can see the Cleveland Size 500RT unit. It transmits power that moves the triple agitator back and forth in the big slurry tank.

Never a failure in 28 years of continuous service

FOR 28 years a Cleveland Worm Gear Speed Reducer has operated this triple traveling agitator. Unsheltered from the weather, it has been in service continuously, with never a replacement part or a repair.

This is a typical service record for Clevelands. Manufactured in a plant where high quality is the yardstick, by a company that has specialized on worm gearing for 44 years, every Cleveland unit can be depended on to perform satisfactorily, year in, year out.

Whenever you need a speed reducer or a drive, think of Cleveland. Sales representatives in all leading industrial markets are ready to discuss your problems and help you select the right Cleveland drives to meet your requirements. Write for our current Catalog 400. The Cleveland Worm and Gear Co., 3270 E. 80th St., Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

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The new Cutler-Hammer Three-Star Unitrol provides for the quickest installation or rearrangement of the finest in motor control equipment, cost-saving Cutler-Hammer Three-Star Motor Control.

All motor control is built to high standards; functional importance requires it. But the comparison of several makes in *actual use* proves there can be wide differences!

One make of control, for example, is much easier to install, so *much* faster that the man-hours saved in installing it often more than pay the entire cost of this control . . . Cutler-Hammer Three-Star Motor Control! Comparison in use also proves this control works better, makes electric motors work harder, avoids costly work interruptions. Cutler-Hammer Three-Star Motor Control in industry's "killer" jobs has shown a trouble-free operating life *several times* that of whatever control equipment it replaced.

Discover why this is industry's preferred motor control. Compare it in *use* and see why you should also specify it as your standard. , , , CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto.

The Panel Builder's Handbook, a comprehensive data book on Cutler-Hammer Three-Star Motor Control components and accessories is offered free of charge to machine design and control panel engineers. Write today on your company letterhead for Pub. EE-120.

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